C21.5: 944/4

Vol. 944 Number 4

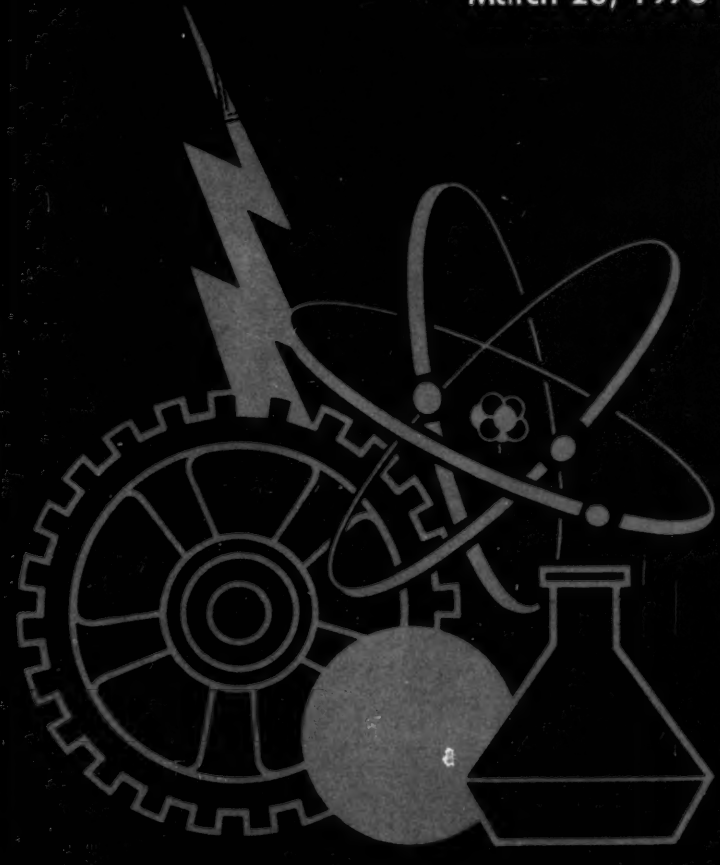
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

March 23, 1976



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

March 23, 1976 Volume 944 Number 4

CONTENTS

	Page
Patent and Trademark Notices	
Registration to Practice	1546
Second Trial Voluntary Protest Program Published Applications	1546
Patent Applications Published Under Second Trial Voluntary Protest Program	1546
Second Trial Voluntary Protest Program	1546
Patent Notices	
Certificates of Correction for the Week of March 23, 1976	1548
Adverse Decisions in Interferences	1548
Disclaimers	1548
National Technical Information Service	1548
Condition of Patent Applications	1556
Patent Applications Published Under Second Trial Voluntary Protest Program	
General and Mechanical	1557
Chemical	1568
Electrical	1599
Reissue Patents Granted (28,740)	1613
Plant Patents Granted (3,846)	1615
Patents Granted	
General and Mechanical (3,945,041)	1617
Chemical (3,945,791)	1866
Electrical (3,946,141)	1971
Design Patents Granted (239,215)	2073
Index of Applicants and Assignees of Published Applications	PI 1
Classification of Published Patent Applications	PI 7
Index of Patentees	PI 15
Index of Reissue Patentees	PI 59
Index of Plant Patentees	PI 59
Index of Design Patentees	PI 59
Classification of	
Patents (Including Reissues)	PI 63
Designs and Plants	PI 66
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 67
Designs and Plants	PI 69

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $342.20 per annum, foreign mailing $85.55 additional; single copies $6.60 each.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $88.40 per annum, foreign mailing $22.10 additional; single copies $1.70 each.

CIRCULARS OF GENERAL INFORMATION concerning PATENTS, price 60 cents each.

CIRCULARS OF GENERAL INFORMATION concerning TRADEMARKS, price 50 cents each.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS AND DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before April 9, 1976.

Baker, Donald R., 2239 Kemmerer St., Bethlehem, Pa. 18017
Botjer, William L., 1097 Third Ave., New York, N.Y. 10021
Carlson, Richard L., 32011 Valley View, Farmington, Mich. 48024
Chiarchiaro, Frank J., 1277 E. 4th St., Brooklyn, N.Y. 11230
Fleischhauer, Gene D., Stage Harbor Rd., Marlborough, Conn. 06424
Johnson, Lawrence E., 4945 Manitoba Dr., #202, Alexandria, Va. 22312
Pierce, Kay M. H., 160 N. Purdue, Oak Ridge, Tenn. 37830
Rife, Ruth M., RD #3, Oakwood Dr., New Fairfield, Conn. 06810.
Rockwell, Harvey W., 168 Maple Grove, Springfield, Ill. 62707
Tachner, Marvin, 22772 Liberty Bell Rd., Woodland Hills, Calif. 91304
Ziegler, Thomas K., 10215 Cedarbrooke Lane, Kansas City, Mo. 64131

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

Second Trial Voluntary Protest Program

Publication of Applications

January 13, 1976	March 9, 1976
January 20, 1976	March 16, 1976
January 27, 1976	March 23, 1976
February 3, 1976	March 30, 1976
February 10, 1976	April 6, 1976
February 17, 1976	April 13, 1976
February 24, 1976	April 20, 1976 (last publication date)
March 2, 1976	

RICHARD J. SHAKMAN,
Feb. 25, 1976. *Assistant Commissioner for Administration.*

Patent Applications Published Under the Second Trial Voluntary Protest Program

The Note which was printed below the title, "Patent Applications Published Under the Second Trial Voluntary Protest Program," in the February 17 and February 24, 1976 OFFICIAL GAZETTES, pages 1013 and 1493, contained an incorrect date for filing protests.

The correct date for filing protests relating to the patentability of patent applications published in the February 17, 1976 OFFICIAL GAZETTE is May 17, 1976. The correct date for filing protests relating to the patentability of patent applications published in the February 24, 1976 OFFICIAL GAZETTE is May 24, 1976.

RICHARD J. SHAKMAN,
Feb. 26, 1976. *Assistant Commissioner for Administration.*

Second Trial Voluntary Protest Program

A Second Trial Voluntary Protest Program will be conducted during the coming months. It will be increased in scale and somewhat modified in procedure from the first such program. Announcement of and description of the rules for the first program appeared in 923 O.G. 2 on June 4, 1974.

As before, the objective is to gain experience in carrying out such a program and to determine the extent of interest by the public in participating and in supplying pertinent references. To the extent there is participation, the program should be beneficial by bringing new art to the attention of the Office, preventing inadvertent issuance of invalid patents, and increasing confidence in the strength of those patents which survive the protest proceedings.

The first Trial Voluntary Protest Program showed a considerable interest by applicants and the public in taking part in protest proceedings. A summary of the results will be published soon in this Gazette. The second Trial Voluntary Protest Program is designed to gain additional information as to public participation and also to follow more closely the procedures which would be required in a continuing, permanent protest program.

Applications Involved

In the second Trial Voluntary Protest Program, a Request to Participate and Waiver of Confidentiality form (PTOL–224 Temp.) will be sent to each applicant to whom a Notice of Allowance is mailed during a selected three week period, probably in October, 1975. The total number of requests mailed will be about 4,500. Applications for plant patents will be excluded from the program. The reason for this exclusion is the high cost of printing colored drawings and the relatively limited prior art available. No other applications will be excluded from the trial program, regardless of subject matter, type of application or earlier proceedings.

Waiver of Confidentiality

Two copies of the form letter requesting voluntary waiver of confidentiality (form PTOL–224 Temp.) will be mailed in the same envelope along with the Notice of Allowance. An additional copy of the form letter will be made of record in each application at the time of mailing. The applicant will have three months from the notice of allowance date in which to either (1) elect to participate in the Trial Voluntary Protest Program by filing a signed waiver of confidentiality, or (2) elect not to participate in the program by paying the issue fee. If he does neither, the application will become abandoned, as provided in 37 C.F.R. 1.316. The waiver of confidentiality is a part of form PTOL–224 Temp. This procedure will avoid any increase in pendency time for those applications in which an election is made not to participate in the program. An early filing of a waiver of confidentiality by the applicant will result in early publication of the application.

Publication

If the applicant decides not to participate in the protest program and payment of the issue fee is timely made, the patent will issue routinely without delay.

If the applicant elects to participate in the protest program and a signed waiver of confidentiality is filed in the Office within 3 months of the notice of allowance date, the Notice of Allowance will be vacated. In such a case the issue fee should not be filed, as it will not be accepted and applied if filed with a signed waiver of confidentiality. An additional Notice of Allowance will be issued after the protest proceedings have been completed if only allowable claims remain in the application.

After a signed waiver has been filed, the application will be printed in the form of a patent and be available for sale as in the first Trial Voluntary Protest Program. At least one claim and a drawing figure, if any, will be printed in the OFFICIAL GAZETTE. These published applications will appear in about 6 to 9 issues of the OFFICIAL GAZETTE early in 1976. Advance notice will be given in the OFFICIAL GAZETTE of the dates on which applications will be published under this program.

Inspection of Files

The Patent and Trademark Office files of the published applications will be available for inspection by the public for a period of three months after publication. The application files will be retained in a single location in the Patent Issue Division during the protest period. This single location will be staffed with personnel to process papers directed to these files, supervise inspection of the files by the public, provide copies of file contents when ordered, and perform other related duties. A coin operated copying machine will also be available at this location.

Filing of Protests

Protests relating to the patentability of any published application must be filed in writing in the Patent and Trademark Office no later than three months after publication of the application. No extension of the three month protest period will be granted. Each protest must be filed in duplicate (one copy will be forwarded to the applicant and the other copy will be placed in the application file) and must indicate the grounds for protesting the allowance of any claim contained in the published application. If the protest involves prior art not of record in the application, two copies of the alleged prior art, together with an explanation of the relevance of such prior art to the allowed claims, should be included. The protester may also comment on the prior art record in the application and the manner in which it was applied.

In those applications where prima facie evidence of prior public use or sale the claimed invention is presented in accordance with 37 C.F.R. 1.292, public use proceedings will give the protester an opportunity to present evidence.

Should claims be copied from a published application for interference purposes, the applicant copying claims must also file a notice of such copying in the file of the published application to avoid the possibility of inadvertent issuance of the published application as a patent before conclusion of any interference proceedings.

For easy identification, all protests should be headed, "Protest Under Trial Voluntary Protest Program" and be addressed to:

Commissioner of Patents and Trademarks
Box TVPP
Washington, D.C. 20231

The protester should fully identify himself and include his mailing address so that communications may be addressed to him. In view of administrative problems encountered in the first Trial Voluntary Protest Program in protecting the confidentiality of the identity of protesters, no attempt will be made by the Office to maintain the confidentiality of any protester under the new program.

If no protests are received during the protest period, the application file will be rerouted for the mailing of a new Notice of Allowance. The file will not be returned to the examining group except for consideration of matters which normally require return of an allowed file.

If one or more protests are filed in an application, the application file and the protest(s) will be returned to the examining group for consideration.

Consideration of Protest

The examining group will acknowledge receipt of all protests. The authority for deciding whether or not the evidence submitted constitutes a prima facie showing of unpatentability of any allowed claim will reside with the Group Director. If the Group Director decides that no such showing has been made, the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. Protesters will be notified in such cases that prosecution has not been reopened, and the applicant will be sent a duplicate copy of all protests. The decision of the Group Director will be final and will not be subject to petition by a protester.

If the Group Director decides that the submitted evidence constitutes a prima facie showing of unpatentability of any allowed claim, prosecution of the application will be reopened. The decision to reopen prosecution will be communicated to the applicant by means of an Office action, signed by a primary examiner, rejecting any claim considered unpatentable. The duplicate copy of each protest will be mailed to the applicant with the Office action. Protesters who submitted evidence on which the rejection is based will be identified in the Office action and will also receive copies of this and subsequent Office actions. Other protesters will be notified that prosecution has been reopened, but based on evidence and for reasons other than those submitted by them and that, consequently, no further correspondence will be directed to them. The applicant will normally be given a three month shortened statutory period to respond to the Office action.

Response by the Applicant to Subsequent Office Actions

During this period, the applicant may present amended or new claims which will be subject to further consideration by the primary examiner. In order to allow protesters who submitted evidence on which a rejection in the Office action is based to participate in later prosecution and to comment upon further proceedings, applicant will be required to serve by mail upon each protester identified in the Office action, a copy of any response filed, including any appeal brief. Indication of such service will be a required component of a complete response. Applicant need only reply to the rejections and objections made in the Office action. There need be no specific response to any other points raised by the protesters.

Comment on Applicant's Response by the Protester

Each protester served will be allowed one month, running from the date applicant's response or brief is received in the Patent and Trademark Office, to file comments relating thereto. All communications from protesters must be in writing. Examiner interviews with the protesters will not be permitted. No extensions of the one month period will be granted.

Any appeal by the applicant to the Board of Appeals in a protested application will be made special and will be taken up out of order.

Conclusion of Prosecution

If, after further prosecution, the application is found to be allowable, all protesters still participating at that time will be notified and the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. A decision of the primary examiner to allow an application will not be subject to petition or appeal by any protester.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Sept. 16, 1975.

[938 O.G. 945]

PATENT NOTICES

Certificates of Correction for the Week of Mar. 23, 1976

Re. 27,946	3,886,723	3,914,775	3,923,522
Re. 28,221	3,887,460	3,915,197	3,923,580
Re. 28,591	3,890,958	3,915,403	3,923,634
3,376,830	3,894,166	3,915,595	3,923,667
3,499,600	3,894,495	3,915,774	3,923,732
3,737,497	3,894,832	3,915,791	3,923,734
3,758,195	3,896,179	3,916,310	3,924,651
3,764,370	3,897,109	3,916,371	3,924,689
3,772,872	3,898,322	3,917,029	3,924,719
3,778,038	3,899,354	3,917,151	3,924,830
3,779,856	3,899,387	3,917,324	3,924,883
3,782,927	3,899,448	3,917,374	3,924,903
3,782,933	3,901,048	3,917,378	3,925,423
3,784,565	3,901,944	3,917,439	3,925,654
3,787,451	3,902,213	3,917,517	3,925,731
3,788,514	3,902,338	3,917,611	3,925,979
3,788,855	3,902,555	3,917,701	3,926,108
3,793,370	3,902,669	3,917,784	3,926,242
3,809,562	3,904,716	3,917,801	3,926,638
3,811,918	3,905,542	3,918,004	3,926,738
3,819,329	3,906,275	3,918,227	3,926,975
3,820,239	3,907,104	3,918,473	3,926,992
3,821,989	3,907,309	3,919,054	3,927,234
3,828,063	3,907,467	3,919,178	3,927,392
3,828,783	3,907,868	3,919,321	3,927,918
3,829,457	3,908,012	3,919,438	3,927,968
3,831,927	3,908,184	3,919,694	3,928,113
3,832,322	3,908,223	3,919,943	3,928,133
3,833,649	3,908,328	3,920,082	3,928,291
3,834,492	3,908,500	3,920,214	3,928,476
3,842,073	3,909,068	3,920,370	3,928,571
3,843,756	3,909,445	3,920,380	3,929,137
3,847,978	3,910,310	3,920,422	3,929,244
3,851,157	3,910,773	3,920,783	3,929,300
3,852,343	3,910,783	3,920,921	3,929,424
3,854,052	3,910,853	3,920,999	3,929,446
3,856,867	3,910,923	3,921,201	3,929,640
3,857,844	3,910,926	3,921,261	3,930,236
3,864,006	3,911,057	3,921,306	3,930,579
3,864,303	3,911,136	3,921,581	3,930,948
3,865,039	3,911,465	3,921,950	3,930,983
3,866,088	3,911,720	3,922,177	3,931,043
3,868,347	3,912,363	3,922,251	3,931,146
3,868,434	3,912,832	3,922,316	3,931,185
3,869,231	3,912,844	3,922,575	3,931,264
3,871,156	3,913,084	3,922,644	3,931,346
3,873,372	3,913,552	3,922,744	3,931,486
3,873,635	3,913,756	3,922,859	3,932,752
3,876,134	3,914,117	3,922,889	3,932,891
3,877,529	3,914,290	3,923,174	3,933,244
3,882,535	3,914,294	3,923,293	
3,884,648	3,914,503	3,923,340	
3,885,318	3,914,521	3,923,424	

Adverse Decisions in Interferences

In the designated interference involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,334,113, W. J. Houlihan, 9b-PHENYL-1,2,3,9b - TETRAHYDRO - 5H - IMIDAZO[2,1-a]ISOINDOL-5-ONES, Interference No. 99,077, decided Dec. 18, 1975, claims 3, 4, 5 and 6.

Patent No. 3,541,191. J. Thordarson, METHOD FOR MANUFACTURING FILM FROM THERMOPLASTIC RESINOUS FILM-FORMING MATERIALS, Interference No. 99,093, decided Dec. 31, 1975, claims 1, 2, 3, 5 and 6.

Patent No. 3,551,344, Z. G. Gardlund and C. C. Duff, PHOTOCHROMIC PLASTIC AND METHOD OF MAKING, Interference No. 99,074, decided Nov. 17, 1975, claims 1, 2 and 3.

Patent No. 3,574,230, H. A. Cyba, POLYHALOPOLYHYDROPOLYCYCLICDICARBOXYLIC ACID IMIDES, Interference No. 98,213, decided Oct. 9, 1975, claim 4.

Patent No. 3,582,342, K. Itano, M. Nakano, A. Kato, and S. Hoshino, LIGHT-SENSITIVE PHOTOGRAPHIC MATERIALS, Interference No. 98,526, decided Nov. 28, 1975, claims 2, 3, 6, 9 and 11.

Patent No. 3,632,544, N. E. Boyer, SELF-EXTINGUISHING POLYMERIC COMPOSITIONS, Interference No. 98,122, decided Mar. 6, 1975, claims 1, 2 and 3.

Patent No. 3,639,636, J. W. Barnhart, METHOD OF LOWERING SERUM CHOLESTEROL, Interference No. 98,841, decided Nov. 17, 1975, claim 6.

Patent No. 3,660,381, K. Weber, H. Mers, K. Zeile, R. Giesemann and P. Dannenberg, 5-ARYL-1H-1,5-BENZODIAZEPINE-2,4-DIONES, Interference No. 98,772, decided Nov. 11, 1975, claim 1.

Patent No. 3,679,728, C. R. Morgan and D. A. Daniels, PROCESS FOR PREPARING METHYLENEBISIMINODIACETONITRILE, Interference No. 98,879, decided Nov. 28, 1975, claim 7.

Patent No. 3,679,729, D. A. Daniels, CONTINUOUS PROCESS FOR PREPARING METHYLENEBISIMINODIACETONITRILE, Interference No. 98,878, decided Nov. 28, 1975, claim 5.

Patent No. 3,686,163, F. Arcamone, G. Cassinelli, S. Penco and L. Tognoli, DIHYDRODAUNOMYCIN ANTIBIOTIC AND DERIVATIVES THEREOF, Interference No. 98,798, decided Nov. 28, 1975, claims 1, 2, 3 and 6.

Patent No. 3,697,291, C. H. T. Tonsbeek, FURANONE MEAT FLAVOR COMPOSITIONS, Interference No. 98,487, decided Sept. 22, 1975, claims 1, 3, 5, 6 and 7.

Patent No. 3,697,346, H. B. Van Dorn, R. J. Matt and T. P. Rolland, METHOD OF MAKING A COMPOSITE PLASTIC BEARING, Interference No. 98,178, decided Nov. 28, 1975, claims 1, 3, 4, 5, 11, 12, 14 and 17.

Patent No. 3,744,517, T. Budsich, LOAD RESPONSIVE FLUID CONTROL VALVES, Interference No. 99,003, decided Dec. 4, 1975, claims 1 and 2.

Patent No. 3,754,226, E. R. Fearon, CONDUCTIVE-RING FERROMAGNETIC MARKER AND METHOD AND SYSTEM FOR USING SAME, Interference No. 98,962, decided Dec. 23, 1975, claims 3, 4, 6, 8 and 9.

Patent No. 3,815,717, R. E. Arseneau, ELECTRONIC COIN CHANGER CONTROL CIRCUIT, Interference No. 98,987, decided Nov. 19, 1975, claims 1, 2, 3, 5, 7 and 8.

Patent No. 3,820,683, A. S. Jasinski, SPRAY CAN SAFETY CAP, Interference No. 99,084, decided Dec. 23, 1975, claims 1 and 3.

Disclaimers

Design No. 234,161.—*Joseph J. Matvey*, Pittsburgh, Pa. DECORATIVE VEGETATION SUPPRESSING SURROUND FOR GRAVE MARKING STRUCTURES. Patent dated Jan. 21, 1975. Disclaimer filed Jan. 13, 1975, by the inventor.

Hereby disclaims the term of the patent subsequent to Jan. 14, 1989.

3,195,344.—*Charles C. Francisco*, Watertown, Mass. DEW-POINT MEASURING SYSTEM. Patent dated July 20, 1965. Disclaimer filed June 26, 1975, by the assignee, *EG & G, Inc.*

Hereby enters this disclaimer to claims 1, 2, 5, 6, 7, 8, 9 and 12 of said patent.

3,263,346.—*Jean-Paul Vandenhoeck*, New York, N.Y. HEAT EXCHANGING METHOD AND APPARATUS. Patent dated Aug. 2, 1966. Disclaimer filed Oct. 10, 1975, by the assignee, *Envirotech Corporation.*

Hereby enters this disclaimer to claims 1, 2, 3, 8, 10, 11, 12 and 13 of said patent.

3,564,463.—*William D. Beaver*, Center Valley, and *Roger A. Sykes*, Bethlehem, Pa. MONOLITHIC PIEZOELECTRIC FILTER HAVING MASS LOADED ELECTRODES FOR RESONATION REGIONS ACOUSTICALLY COUPLED TOGETHER. Patent dated Feb. 16, 1971. Disclaimer filed Jan. 27, 1976, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby enters this disclaimer to claims 1, 2 and 9 of said patent.

3,664,118.—*Richard S. Walton*, Lancaster, Pa. ELECTRONICALLY CONTROLLED TIMEPIECE USING LOW POWER MOS TRANSISTOR CIRCUITRY. Patent dated May 23, 1972. Disclaimer filed Oct. 3, 1975, by the assignee, *Time Computer, Inc.*

Hereby disclaims the entire term of said patent.

3,725,846.—*Robert Allen Strain*, Florissant, Mo. WATERPROOF HIGH VOLTAGE CONNECTION APPARATUS. Patent dated Apr. 3, 1973. Disclaimer filed Jan. 26, 1976, by the assignee, *International Telephone and Telegraph Corporation.*

Hereby enters this disclaimer to claims 1–4 of said patent.

3,784,887.—*John Leo Sheard*, Williamsville, N.Y. PROCESS FOR MAKING CAPACITORS AND CAPACITORS MADE THEREBY. Patent dated Jan. 8, 1974. Disclaimer filed Feb. 3, 1976, by the assignee, *E. I. du Pont de Nemours and Company.*

Hereby enters this disclaimer to all claims of said patent.

3,799,266.—*Othar M. Kiel*, Homeworth, Ohio. FRACTURING METHOD USING ACID EXTERNAL EMULSIONS. Patent dated Mar. 26, 1974. Disclaimer filed Dec. 15, 1975, by the assignee, *Exxon Production Research Company.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5, 6 and 7 of said patent.

3,798,991.—*Donald L. Kime*, Dayton, and *Ronald G. Stogdill*, Trotwood, Ohio. INTERMEDIATE RIGHT ANGLE SPEED REDUCER. Patent dated Mar. 26, 1974. Disclaimer filed Jan. 29, 1976, by the assignee, *Chemineer, Inc.*

Hereby enters this disclaimer to claims 1, 2, 5, 6 and 8 of said patent.

3,816,761.—*Adel Abdel Aziz Ahmed*, Clinton Township, county of Hunterdon, N.J. COMPARATOR CIRCUITRY. Patent dated June 11, 1974. Disclaimer filed Feb. 5, 1976, by the assignee,, *RCA Corporation.*

Hereby enters this disclaimer to claim 11 of said patent.

3,880,480.—*Lawrence G. Anderson*, Greenhurst, N.Y. NONMETALLIC BEARING HOUSING. Patent dated Apr. 29, 1975. Disclaimer filed Nov. 24, 1975, by the assignee, *TRW Inc.*

Hereby enters this disclaimer to claims 1–3 of said patent.

3,898,186.—*Robert Mermelstein* and *Richard W. Benson*, Cincinnati, Ohio. DISHWASHING COMPOSITIONS CONTAINING GEL FORMING GELATIN. Patent dated Aug. 5, 1975. Disclaimer filed Dec. 11, 1975, by the assignee, *The Procter & Gamble Company.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11 of said patent.

3,914,977.—*Derek John Rimmer*, Walsall, England. PRESSES AND THE LIKE. Patent dated Oct. 28, 1975. Disclaimer filed Dec. 29, 1975, by the assignee, *Cincinnati Milacron Inc.*

Hereby enters this disclaimer to all claims of said patent.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications, either paper copy (PC) or microfiche (MF), can be purchased at the prices cited from the National Technical Information Service (NTIS), Springfield, Va. 22161. Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE ARMY

Office of the Judge Advocate General, Patent Division, Room 2C–455, Pentagon, Washington, D.C. 20310

Patent 3,165,047. Photographic Processing Apparatus. Filed Mar. 1, 1962. Patented Jan. 12, 1965. Not available NTIS.

Patent 3,167,202. Closure Assembly for Container Neck. Filed Jan. 15, 1964. Patented Jan. 26, 1965. Not available NTIS.

Patent 3,167,265. Film Reel Drive. Filed Nov. 8, 1962. Patented Jan. 26, 1965. Not available NTIS.

Patent 3,167,393. Method of Producing Pure Single Crystals of Graphite. Filed Apr. 5, 1962. Patented Jan. 26, 1965. Not available NTIS.

Patent 3,167,429. Monobaths Containing Sodium Polyacrylate and Polyvinyl-Pprrolidone. Filed May 26, 1961. Patented Jan. 26, 1965. Not available NTIS.

Patent 3,169,070. Method for use in Freeze-Vacuum Dehdration of Meat. Filed Apr. 5, 1961. Patented Feb. 9, 1965. Not available NTIS.

Patent 3,170,473. Captive Bolt. Filed Sept. 12, 1962. Patented Feb. 23, 1965. Not available NTIS.

Patent 3,171,048. Crystal Frequency Temperature Compensation. Filed June 7, 1963. Patented Feb. 23, 1965. Not available NTIS.

Patent 3,179,533. Magnetic Tape with Reinforced Backing. Filed Oct. 4, 1961. Patented Apr. 20, 1965. Not available NTIS.

Patent 3,732,821. Nose Ogive for Nonlethal Projectile. Filed May 25, 1971. Patented May 15, 1973. Not available NTIS.

Patent 3,732,824. Means for Converting Impulse Linear Acceleration to Rotational Inertia. Filed Apr. 28, 1971. Patented May 15, 1973. Not available NTIS.

Patent 3,733,138. Optical System for Inspection of a Cavity. Filed June 14, 1972. Patented May 15, 1973. Not available NTIS.

Patent 3,733,489. Radiation Timing Device. Filed July 7, 1971. Patented May 15, 1973. Not available NTIS.

Patent 3,733,597. Proximity Detector and Alarm Utilizing Field Effect Transistors. Filed Aug. 29, 1969. Patented May 15, 1973. Not available NTIS.

Patent 3,734,116. Back Pressure Sensitive Switch for a Flueric Device. Filed Sept. 1, 1971. Patented May 22, 1973. Not available NTIS.

Patent 3,734,592. High Intensity Light Limiting Device. Filed June 21, 1971. Patented May 22, 1973. Not available NTIS.

Patent 3,734,723. Compacted and Sintered Powder Mass Having a Discrete Cavity in the Mass and Method of Forming. Filed Sept. 4, 1970. Patented May 22, 1973. Not available NTIS.

Patent 3,734,983. Continuous Melt-Pour Process for High Explosives. Filed Aug. 23, 1971. Patented May 22, 1973. Not available NTIS.

Patent 3,735,137. Large, Two Dimension, Screen for Converting an Optical Image Projected on One Side to an Identical Infrared Image Display on the Other Side. Filed May 2, 1972. Patented May 22, 1973. Not available NTIS.

Patent 3,738,223. Obturator-Extractor Device for Firearms. Filed Nov. 23, 1971. Patented June 12, 1973. Not available NTIS.

Patent 3,738,224. Obturated Firearm Breech Safety Device. Filed Nov. 23, 1971. Patented June 12, 1973. Not available NTIS.

Patent 3,738,278. Coloured Smoke Production. Filed June 7, 1971. Patented June 12, 1973. Not available NTIS.

Patent 3,739,082. Ordered Dither System. Filed Feb. 29, 1972. Patented June 12, 1973. Not available NTIS.

Patent 3,740,740. Liquid Cryogen Detector. Filed Jan. 12, 1972. Patented June 19, 1973. Not available NTIS.

Patent 3,741,479. Drive-Off Aid for Wheeled Vehicles and Method. Filed Oct. 4, 1971. Patented June 26, 1973. Not available NTIS.

Patent 3,741,727. Arsenic Sampler. Filed Feb. 4, 1972. Patented June 26, 1973. Not available NTIS.

Patent 3,744,369. Thermite Cable Cutter. Filed July 16, 1971. Patented July 10, 1973. Not available NTIS.

Patent 3,744,418. Flares. Filed June 3, 1971. Patented July 10, 1973. Not available NTIS.

Patent 3,744,971. Fuel-Metal Compatibility Test Unit. Filed May 28, 1971. Patented July 10, 1973. Not available NTIS.

Patent 3,745,051. Quadruple Lap Simple Shear Test Specimen. Filed Nov. 9, 1971. Patented July 10, 1973. Not available NTIS.

Patent 3,745,100. Method of Preparing Semiporous Film of Aluminum Oxide Voltage Anodization. Filed Dec. 22, 1971. Patented July 10, 1973. Not available NTIS.

Patent 3,745,127. Composition of Matter Containing Carbon. Filed Mar. 20, 1972, patented July 10, 1973. Not available NTIS.

Patent 3,745,404. Imaging Tube with Sensitivity Threshold. Filed July 23, 1971. Patented July 10, 1973. Not available NTIS.

Patent 3,745,832. Link-Type Hypersonic Centrifuge. Filed May 13, 1971. Patented July 17, 1973. Not available NTIS.

Patent 3,746,905. High Vacuum Field Effect Electron Tube. Filed Dec. 21, 1971. Patented July 17, 1973. Not available NTIS.

Patent 3,747,007. Variable Compensation for Feedback Control Systems. Filed July 7, 1972. Patented July 17, 1973. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Mgmt. Branch, General Services Division, Federal Bldg. Agricultural Research Service, Hyattsville, Md. 20782

Patent 3,872,935. Apparatus and Method for Obtaining Undisturbed Soil Core Samples. Filed Apr. 30, 1974. Patented Mar. 25, 1975. Not available NTIS.

U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

Assistant General Counsel for Patents, Washington, D.C. 20230

Patent application 538,061. Methanation Process Utilizing Split Cold Gas Recycle. Filed Jan. 2, 1975. PC $3.25/MF $2.25.

Patent application 541,376. Agglomerating Combustor-Gasifier Method and Apparatus for Coal Gasification. Filed Jan. 15, 1975. PC $3.25/MF $2.25.

Patent 3,870,099. Seal Assembly. Filed May 19, 1972. Patented Mar. 11. 1975. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch, Westwood Bldg., Bethesda, Md. 20014

Patent application 568,986. Metal-Staining Assay (MSA) and Metal-Staining Inhibition Assay (MSIA) Detecting and Measuring Device For Detecting and Measuring an Antigen-Antibody Reaction. Filed Apr. 17, 1975. PC $3.25/MF $2.25.

Patent 3,898,412. Positive Position Interlock Concealment Shutter. Filed May 21, 1974. Patented Aug. 5, 1975. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts. NW., Washington, D.C. 20240

Patent application 495,351. Boltless Segmented Tunnel Lining Backed with Polyurethane Foam. Filed Aug. 7, 1974. PC $3.25/MF $2.25.

Patent application 509,153. Two-Stage Disposable Particle Sampling Head. Filed Sept. 25, 1974. PC $3.25/MF $2.25.

Patent application 515,390. Process for Separating Liquids from Suspensions. Filed Oct. 16, 1974. PC $3.25/MF $2.25.

Patent application 522,169. Emergency Breather Apparatus. Filed Nov. 8, 1974. PC $3.25/MF $2.25.

Patent application 554,834. Method for Applying Wax or Plastic Coatings to Granular Materials. Filed Mar. 3, 1975. PC $3.25/MF $2.25.

Patent application 554,838. Wax or Plastic Coated Phosphor Grains. Filed Mar. 3, 1975. PC $3.25/MF $2.25.

Patent application 554,839. Combination of Band-Type and Line-Type Emission Phosphors. Filed Mar. 3, 1975. PC $3.25/MF $2.25.

Patent application 554,993. Diluents for Coded Phosphor Grains. Filed Mar. 3, 1975. PC $3.25/MF $2.25.

Patent application 559,936. Powder Agglomerator and Its Method of Use. Filed Mar. 19, 1975. PC $3.25/MF $2.25.

Patent application 559,941. Process for Recovering Adsorbed Gold and/or Silver Values from Activated Carbon. Filed Mar. 19, 1975. PC $3.25/MF $2.25.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

Patent application 583,486. Three Phase Full Wave DC Motor Decoder. Filed June 3, 1975. PC $3.25/MF $2.25.

Patent application 591,569. Mechanical Thermal Motor. Filed June 30, 1975. PC $3.25/MF $2.25.

Patent application 593,142. Magnetic Bearing System. Filed July 3, 1975. PC $3.75/MF $2.25.

Patent application 594,971. Rotating Joint Signal Coupler. Filed July 11, 1975. PC $3.25/MF $2.25.

Patent application 595,197. Method and Apparatus for Neutralizing Potentials Induced on Spacecraft Surfaces. Filed July 11, 1975. PC $3.25/MF $2.25.

Patent 3,189,784. Very High Intensity Light Source Using a Cathode Ray Tube. Patented June 15, 1965. Not available NTIS.

Patent 3,275,794. Apparatus for Welding Sheet Material. Patented Sept. 27, 1966. Not available NTIS.

Patent 3,281,558. Multiple Circuit Protector Device. Patented Oct. 25, 1966. Not available NTIS.

Patent 3,373,016. Brazing Alloy. Patented Mar. 12, 1968. Not available NTIS.

Patent 3,411,900. Brazing Alloy Composition. Patented Nov. 19, 1968. Not available NTIS.

Patent 3,454,766. Method and Apparatus for Vibration Analysis Utilizing the Mossbauer Effect. Patented July 8, 1969. Not available NTIS.

Patent 3,475,442. Brazing Alloy Binder. Patented Oct. 28, 1969. Not available NTIS.

Patent 3,551,831. Traveling Wave Solid State Amplifier Utilizing a Semiconductor with Negative Differential Mobility. Patented Dec. 29, 1970. Not available NTIS.

Patent 3,884,432. High Lift Aircraft. Patented May 20, 1975. Not available NTIS.

Patent 3,884,765. Automatic Microbial Transfer Device. Patented May 20, 1975. Not available NTIS.

Patent 3,888,362. Cooperative Multiaxis Sensor for Teleoperation of Article Manipulating Apparatus. Patented June 10, 1975. Not available NTIS.

Patent 3,891,311. Multiparameter Vision Testing Apparatus. Patented June 24, 1975. Not available NTIS.

Patent 3,891,533. Electrolytic Cell Structure. Patented June 24, 1975. Not available NTIS.

Patent 3,891,848. Fluorescence Detector for Monitoring Atmospheric Pollutants. Patented June 24, 1975. Not available NTIS.

Patent 3,891,851. Impact Position Detector for Outer Space Particles. Patented June 24, 1975. Not available NTIS.

Patent 3,893,449. Reference Apparatus for Medical Ultrasonic Transducer. Patented July 8, 1975. Not available NTIS.

Patent 3,893,458. Heat Sterilizable Patient Ventilator. Patented July 8, 1975. Not available NTIS.

Patent 3,894,289. High Power Laser Apparatus and System. Patented July 8, 1975. Not available NTIS.

U.S. DEPARTMENT OF THE ARMY

Office of the Judge Advocate General, Patent Division, Room 2C–455, Pentagon, Washington, D.C. 20310

Patent 3,154,497. Method of Improving the Storage Properties of Alkaline Detergent Compositions. Filed Mar. 21, 1962. Patented Oct. 27, 1964. Not available NTIS.

Patent 3,156,039. High Energy Forming Process. Filed Sept. 24, 1963. Patented Nov. 10, 1964. Not available NTIS.

Patent 3,156,041. Method of Soldering and Brazing Structural Elements. Filed Apr. 18, 1960. Patented Nov. 10, 1964. Not available NTIS.

Patent 3,157,423. Multiple Pallet Unitizing Frame. Filed Oct. 19, 1962. Patented Nov. 17, 1964. Not available NTIS.

Patent 3,157,931. Backing Plate Hanger. Filed July 29, 1963. Patented Nov. 24, 1964. Not available NTIS.

Patent 3,158,778. Phase Modulated Television Camera Tube. Filed Mar. 7, 1962. Patented Nov. 24, 1964. Not available NTIS.

Patent 3,160,649. Synthesis of Methylthiomethyl Isothiocyanate. Filed Feb. 2, 1961. Patented Dec. 8, 1964. Not available NTIS.

Patent 3,161,248. Vehicle Wheel Suspension. Filed June 8, 1962. Patented Dec. 15, 1964. Not available NTIS.

Patent 3,161,272. Self-Energizing Clutch. Filed May 3, 1962. Patented Dec. 15, 1964. Not available NTIS.

Patent 3,161,399. Stop Valve Mechanism. Filed Sept. 19, 1961. Patented Dec. 15, 1964. Not available NTIS.

Patent 3,161,452. Mounting Adapter for Electrical Connectors. Filed Sept. 5, 1963. Patented Dec. 15, 1964. Not available NTIS.

Patent 3,162,603. Method of Growing Iridium Substituted Single Crystal Using Bismuth Oxide Flux. Filed Feb. 1, 1962. Patented Dec. 22, 1964. Not available NTIS.

Patent 3,162,724. System for Transmission of Binary Information at Twice the Normal Rate. Filed July 3, 1961. Patented Dec. 22, 1964. Not available NTIS.

Patent 3,164,023. Motion Sensing Transducer. Filed Sept. 10, 1962. Patented Jan. 5, 1965. Not available NTIS.

Patent 3,164,148. Insulated Container. Filed Jan. 15, 1964. Patented Jan. 5, 1965. Not available NTIS.

Patent 3,164,745. Sweep Collapse and Rotation Failure Alarm System for PPI Display Device. Filed May 2, 1961. Patented Jan. 5, 1965. Not available NTIS.

Patent 3,164,983. Horizontal Displacement Meter. Filed Nov. 30, 1960. Patented Jan. 12, 1965. Not available NTIS.

Patent 3,165,047. Photographic Processing Apparatus. Filed Mar. 1, 1962. Patented Jan. 12, 1965. Not available NTIS.

Patent 3,165,588. Tune Division Multiplex Digital Communication System Employing Delta Modulation. Filed Nov. 25, 1960. Patented Jan. 12, 1965. Not available NTIS.

Patent 2,165,651. Piezoelectric Crystal Apparatus. Filed Dec. 1, 1959. Patented Jan. 12, 1965. Not available NTIS.

Patent 3,167,265. Film Reel Drive. Filed Nov. 8, 1962. Patented Jan. 26, 1965. Not available NTIS.

Patent 3,179,533. Magnetic Tape with Reinforced Backing. Filed Oct. 4, 1961. Patented Apr. 20, 1965. Not available NTIS.

Patent 3,179,597. Vertical Adherence Paint Remover Compositions. Filed Nov. 7, 1961. Patented Apr. 20, 1965. Not available NTIS.

Patent 3,180,021. Weld Joint Backing and Method of Welding with Same. Filed Nov. 21, 1962. Patented Apr. 27, 1965. Not available NTIS.

Patent 3,183,438. Modulated Power Measuring Bridge with Automatic A.C. and D.C. Rebalancing. Filed Mar. 8, 1960. Patented May 11, 1965. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements & Patent Mgmt. Branch, General Services Division, Federal Bldg., Agricultural Research Service, Hyattsville, Md. 20782

Patent application 587,923. Treatment of Wood with Butylene Oxide. Filed June 18, 1975. PC $3.25/MF $2.25.

Patent application 588,099. Low Density Fiberboard and Method of Making the Same. Filed June 18, 1975. PC $3.25/MF $2.25.

Patent 3,862,028. Flotation-Beneficiation of Phosphate Ores. Filed Nov. 20, 1973. Patented Jan. 21, 1975. Not available NTIS.

Patent 3,865,802. Process for Obtaining Full-Fat Oilseed-Protein Beverages Using Water and Initial Acid pH. Filed June 20, 1973. Patented Feb. 11, 1975. Not available NTIS.

Patent 3,870,727. Production of Harringtonine and Isoharringtonine. Filed Apr. 27, 1972. Patented Mar. 11, 1975. Not available NTIS.

U.S. DEPARTMENT OF TRANSPORTATION

Patent Counsel, 400 7th St. SW., Washington, D.C. 20590

Patent application 597,557. Inflatable Drag Reducer for Land Vehicles. Filed July 21, 1975. PC $3.25/MF $2.25.

U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

Assistant General Counsel for Patents, Washington, D.C. 20545

Patent application 503,544. Decomposition of Carbohydrate Wastes. Filed Sept. 5, 1974. PC $3.25/MF $2.25.

Patent application 534,328. Production of MHD Fluid. Filed Dec. 19, 1974. PC $3.25/MF $2.25.

Patent application 539,889. Methanation Process. Filed Jan. 23, 1975. PC $3.25/MF $2.25.

Patent application 550,099. Method and Apparatus for Measuring Incombustible Content of Coal Mine Dust Using Gamma Ray Backscatter. Filed Feb. 14, 1975. PC $3.25/MF $2.25.

Patent application 551,225. Electrode Assembly. Filed Feb. 19, 1975. PC $3.25/MF $2.25.

Patent 3,865,632. Terminal for Thermoelectric Element. Filed Apr. 23, 1973. Patented Feb. 11, 1975. Not available NTIS.

Patent 3,866,075. Vacuum Type Trigger Discharge Tube with Cup Shaped Anode. Filed May 9, 1974. Patented Feb. 11, 1975. Not available NTIS.

Patent 3,870,099. Seal Assembly. Filed May 19, 1972. Patented Mar. 11, 1975. Not available NTIS.

Patent 3,872,718. Multipurpose Sampler Device for Liquid Metal. Filed Oct. 30, 1973. Patented Mar. 25, 1975. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents 18th and C Sts. NW., Washington, D.C. 20240

Patent application 478,838. Hard Hat Air Curtain. Filed June 13, 1974. PC $3.25/MF $2.25.

Patent application 488,082. A Process and Composition for Cleaning Hot Fuel Gas. Filed July 12, 1974. PC $3.25/MF $2.25.

Patent application 491,012. Method and Apparatus for Direct Contact Multi-Stage Flash Desalination. Filed July 23, 1974. PC $3.25/MF $2.25.

Patent application 495,486. Process for Manufacturing Wallboard and the Like. Filed Aug. 8, 1974. PC $3.25/MF $2.25.

Patent application 497,422. Method for Coating Ferrous Metals with Iron Sulfide by Reaction with Sulfur and Articles Produced Thereby. Filed Aug. 14, 1974. PC $3.25/MF $2.25.

Patent application 498,333. Use of Scavenger in Recovery of Metal Values. Filed Aug. 18, 1974. PC $3.25/MF $2.25.

Patent application 499,103. Transmitter-Receiver System. Filed Aug. 20, 1974. PC $3.25/MF $2.25.

Patent application 502,265. Vibrating Wire Stress Meter and Method to Clamp Wires. Filed Sept. 3, 1974. PC $3.25/MF $2.25.

Patent application 504,925. Polymer Concrete. Filed Sept. 11, 1974. PC $3.25/MF $2.25.

Patent application 507,099. Bed Level Monitor. Filed Sept. 18, 1974. PC $3.25/MF $2.25.

Patent application 518,131. Quick-Slide Color Process. Filed Oct. 25, 1974. PC $3.25/MF $2.25.

Patent application 559,942. Hydrometallurgical Process for Copper Recovery from Sulfide Ores. Filed Mar. 19, 1975. PC $3.25/MF $2.25.

Patent application 571,180. Fire Prevention System. Filed Apr. 24, 1975. PC $3.25/MF $2.25.

Patent application 57 ,496. Remote Sealing of Mine Passages. Filed Apr. 25, 1975. PC $3.25/MF $2.25.

Patent application 574,992. Method and Apparatus for Determining Rock Stress in Situ. Filed May 6, 1975. PC $3.75/MF $2.25.

Patent 3,823,019. Mine Wall Coating. Filed Sept. 6, 1972. Patented July 9, 1974. Not available NTIS.

Patent 3,825,651. Recovery of Gold from Ores. Filed Oct. 14, 1971. Patented July 23, 1974. Not available NTIS.

Patent 3,826,128. Surface Deformation Indicating Apparatus. Filed Feb. 1, 1973. Patented July 30, 1974. Not available NTIS.

Patent 3,826,667. Magnetite Coating Composition. Filed Nov. 30, 1972. Patented July 30, 1974. Not available NTIS.

Patent 3,826,971. Determination of Sulfate Using Ferric Ion-Selective Electrode. Filed Apr. 12, 1973. Patented July 30, 1974. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

Patent application 589,119. Charge-Coupled Device Data Processor for an Airborne Imaging Radar System. Filed June 23, 1975. PC $3.75/MF $2.25.

Patent application 590,182. Thrust Bearing. Filed June 25, 1975. PC $3.25/MF $2.25.

Patent 3,884,432. High Lift Aircraft. Patented May 20, 1975. Not available NTIS.

DEPARTMENT OF THE ARMY

Chief, Patents Division, Office of Judge Advocate General, Patent Division, Room 2C–455, Pentagon, Washington, D.C. 20310

Patent 2,870,836. Trepanned Core Cutoff Tool. Filed May 19, 1955. Patented Jan. 27, 1959. Not available NTIS.

Patent 2,877,097. Method of Purification of Silicon Compounds. Filed May 6, 1958. Patented Mar. 10, 1957. Not available NTIS.

Patent 2,881,276. All-Ways Acceleration Switch. Filed May 1, 1956. Patented Apr. 7, 1959. Not available NTIS.

Patent 2,881,319. Automatic Frequency Control System. Filed June 7, 1957. Patented Apr. 7, 1959. Not available NTIS.

Patent 2,928,516. Stop Mechanism. Filed Feb. 20, 1959. Patented Mar. 15, 1960. Not available NTIS.

Patent 2,928,714. Epichlorohydrin Treatment of Feathers. Filed Apr. 23, 1957. Patented Mar. 15, 1960. Not available NTIS.

Patent 2,928,791. Temperature Indicators. Filed June 20, 1957. Patented Mar. 15, 1960. Not available NTIS.

Patent 2,958,387. Silencer for Compressible Fluid Devices. Filed Sept. 29, 1955. Patented Nov. 1, 1960. Not available NTIS.

Patent 2,959,052. Spherical Anemometer. Filed Dec. 10, 1957. Patented Nov. 8, 1960. Not available NTIS.

Patent 2,959,502. Fabrication of Semiconductor Devices. Filed Sept. 1, 1959. Patented Nov. 8, 1960. Not available NTIS.

Patent 2,959,506. Low Alloy High Tensile Strength High Impact Strength Steel. Filed Aug. 4, 1958. Patented Nov. 8, 1960. Not available NTIS.

Patent 2,961,292. Process for Inhibiting Acid Cleaned Cooling Systems. Filed Mar. 24, 1959. Patented Nov. 22, 1960. Not available NTIS.

Patent 2,965,879. Sound Locating Means. Filed Feb. 5, 1946. Patented Dec. 20, 1960. Not available NTIS.

Patent 3,982,211. Combustible Cartridge Case and Method of Making Same. Filed Apr. 20, 1953. Patented May 2, 1961. Not available NTIS.

Patent 2,990,602. Method of Hot-Pressing Ceramic Ferro-Electric Materials. Filed Jan. 5, 1959. Patented July 4, 1961. Not available NTIS.

Patent 3,018,451. Piezoelectric Resonator with Oppositely Poled Ring and Spot. Filed Dec. 4, 1958. Patented Jan. 23, 1962. Not available NTIS.

Patent 3,152,815. Intra Vehicle Mechanical Connector. Filed June 3, 1963. Patented Oct. 13, 1964. Not available NTIS.

Patent 3,152,938. Method of Making Printed Circuits. Filed June 12, 1957. Patented Oct. 13, 1964. Not available NTIS.

Patent 3,153,825. Carbon-Bonded Refractory Casting Mold and Process for Fabrication Thereof. Filed Jan. 8, 1962. Patented Oct. 27, 1964. Not available NTIS.

Patent 3,209,362. Log-Periodic Bow-Tie Antenna. Filed Jan. 8, 1964. Patented Sept. 28, 1965. Not available NTIS.

Patent 3,210,841. Method and Apparatus for Lens Mounting. Filed Mar. 15, 1962. Patented Oct. 12, 1965. Not available NTIS.

Patent 3,210,897. Ground Anchor Securing Device. Filed May 14, 1962. Patented Oct. 12, 1965. Not available NTIS.

Patent 3,211,019. Push-Pull Remote Control Device. Filed May 20, 1963. Patented Oct. 12, 1965. Not available NTIS.

Patent 3,211,465. Rolling Liquid Transporter. Filed Sept. 4, 1963. Patented Oct. 12, 1965. Not available NTIS.

Patent 3,211,639. Apparatus for Electrophoretic Deposition of Lamellar Fluorophlogopite Mica Sheets. Filed May 27, 1964. Patented Oct. 12, 1965. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Chief, Research Agreements and Patent Mgmt. Branch, Federal Bldg., General Services Division, Agricultural Research Service, Hyattsville, Md. 20782

Patent application 576,757. Helical Head Comminuting Shear. Filed May 12, 1975. PC $3.25/MF $2.25.

ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

Assistant General Counsel for Patents, Washington, D.C. 20545

Patent 3,865,298. Solder Leveling. Filed Aug. 14, 1973. Patented Feb. 11, 1975. Not available NTIS.

Patent 3,866,786. Energy Absorbing Structure in a Steam Generator. Filed Sept. 22, 1972. Patented Feb. 18, 1975. Not available NTIS.

Patent 3,867,017. Apodised Aperture Assembly for High Power Lasers. Filed Nov. 27, 1973. Patented Feb. 18, 1975. Not available NTIS.

Patent 3,867,627. Fast Data Acquisition System. Filed Jan. 8, 1974. Patent Feb. 18, 1975. Not availbale NTIS.

Patent 3,867,688. Elertrodeless Conductance Measurement Device. Filed Dec. 18, 1973. Patented Feb. 18, 1975. Not available NTIS.

Patent 3,868,994. Liquid Metal Operated Heat Exchanger. Filed Feb. 26, 1973. Patented Mar. 4, 1975. Not available NTIS.

Patent 3,870,099. Seal Assembly. Filed May 19, 1972. Patented Mar. 11, 1975. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institute of Health, Chief, Patent Branch, Westwood Building, Bethesda, Md. 20014

Patent application 571,307. Texturing of Polymeric Surfaces of Implant Devices for Tissue Ingrowth. Filed Apr. 24, 1975. PC $3.25/MF $2.25.

Patent application 576,581. Gas Flow Monitor for Anesthetic Machines. Filed May 12, 1975. PC $3.25/MF $2.25.

Patent application 587,974. Temperature-Sensitive Recombinant Mutant Viruses and a Process for Producing Same. Filed June 18, 1975. PC $3.25/MF $2.25.

Patent 3,632,774. Method of Treating Rheumatoid Arthritis with Histidine. Filed Mar. 30, 1970. Patented Jan. 4, 1972. Not available NTIS.

Patent 3,887,697. Hemagglutination Method for Australia Antigen and Antibody Thereto. Filed Aug. 9, 1971. Patented June 3, 1975. Not available NTIS.

Patent 3,887,804. Radiographic Test Stand. Filed Dec. 3, 1973. Patented June 3, 1975. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts., NW., Washington, D.C. 20240

Patent application 491,726. Method for Removal of Methane from Coalbeds. Filed July 25, 1974. PC $3.25/MF $2.25.

Patent application 497,446. Preparation of TiO_2 and Artificial Rutile from Sodium Titanate. Filed Aug. 14, 1974. PC $3.25/MF $2.25.

Patent application 500,797. Charging an Electric Furnace. Filed Aug. 26, 1974. PC $3.25/MF $2.25.

Patent application 501,002. Method for the Decomposition of Hydrogen Sulfide. Filed Aug. 15, 1974. PC $3.25/MF $2.25.

Patent application 503,536. Preparation of Alloys. Filed Sept. 5, 1974. PC $3.25/MF $2.25.

Patent application 504,464. Extraction of Metal Values from Ores. Filed Sept. 11, 1974. PC $3.25/MF $2.25.

Patent application 504,468. Acoustic Method and Apparatus for Determining Effectiveness of Mine Passage Seal. Sept. 11, 1974. PC $3.25/MF $2.25.

Patent application 508,013. Magnetic Ore Separator. Filed Sept. 20, 1974. PC $3.25/$2.25.

Patent application 509,152. Formation of Metal Filaments by Solid State Reactions. Filed Sept. 25, 1974. PC $3.25/MF $2.25.

Patent application 515,779. Differential Distillation of Helium and Apparatus Therefor. Filed Oct. 17, 1974. PC $3.25/MF $2.25.

Patent 3,826,808. Process for Recovering Tungsten from Alkaline Brine. Filed Aug. 2, 1973. Patented July 30, 1974. Not available NTIS.

Patent 3,827,954. Electrodeposition of Metallic Boride Coatings. Filed Aug. 17, 1972. Patented Aug. 6, 1974. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

Patent application 572,991. Application of Luciferase Assay for Atp to Antimicrobial Drug Susceptibility Testing. Filed Apr. 30, 1975. PC $3.75/MF $2.25.

Patent application 581,514. Anti-Gravity Device. Filed May 28, 1975. PC $3.25/MF $2.25.

Patent application 582,318. Switchable Beamwidth Monopulse Method and System. Filed May 30, 1975. PC $3.75/MF $2.25.

Patent application 584,094. A Zirconium Modified Nickel-Copper Alloy. Filed June 5, 1975. PC $3.25/MF $2.25.

Patent application 585,420. Static Coefficient Test Method and Apparatus. Filed June 9, 1975. PC $3.25/MF $2.25.

Patent application 589,172. Preparation of Dielectric Coatings of Variable Dielectric Constant by Plasma Polymerization. Filed June 23, 1975. PC $3.25/MF $2.25.

Patent application 589,173. Space Communication System for Compressed Data with a Concatenated Reed Solomon-Viterbi Coding Channel. Filed June 23, 1975. PC $3.75/MF $2.25.

Patent application 589,233. Solid State Current Transformer. Filed June 23, 1975. PC $3.25/MF $2.25.

Patent application 590,183. Simulator for Practicing the Mating of an Observer-Controlled Object with a Target. Filed June 25, 1975. PC $3.25/MF $2.25.

Patent 3,875,394. Correlation Type Phase Detector. Patented Apr. 1, 1975. Not available NTIS.

Patent 3,884,432. High Lift Aircraft. Patented May 20, 1975. Not available NTIS.

Patent 3,887,233. Shoulder Harness and Lap Belt Restraint System. Patented June 3, 1975. Not available NTIS.

Patent 3,887,345. Gas Chromatograph Injection System. Filed June 3, 1975. Not available NTIS.

Patent 3,887,365. Process for Making Sheets with Parallel Pores of Uniform Size. Patented June 3, 1975. Not available NTIS.

Patent 3,888,410. Fluid Control Apparatus and Method. Patented June 10, 1975. Not available NTIS.

Patent 3,888,705. Vapor Phase Growth of Groups 3–5 Compounds by Hydrogen Chloride Transport of the Elements. Patented June 10, 1975. Not available NTIS.

Patent 3,889,064. Asynchronous, Multiplexing, Single Line Transmission and Recovery Data System. Patented June 10, 1975. Not available NTIS.

Patent 3,889,122. Method of Determining Bond Quality of Power Transistors Attached to Substrates. Patented June 10, 1975. Not available NTIS.

Patent 3,889,155. Apparatus for Calibrating an Image Dissector Tube. Patented June 10, 1975. Not available NTIS.

Patent 3,889,182. Resonant Waveguide Stark Cell. Patented June 10, 1975. Not available NTIS.

Patent 3,889,185. Lightning Current Measuring Systems. Patented June 10, 1975. Not available NTIS.

Patent 3,889,264. Vehicle Locating System Utilizing AM Broadcasting Station Carriers. Patented June 10, 1975. Not available NTIS.

U.S. DEPARTMENT OF THE ARMY

Office of Judge Advocate General, Patent Division, Room 2C–455, Pentagon, Washington, D.C. 20310

Patent 3,190,958. Frequency Shift-Keyed Signal Generator with Phase Mismatch Prevention Means. Filed Sept. 5, 1962. Patented June 22, 1965. Not available NTIS.

Patent 3,191,120. Bridge-Type Cathode Interface Impedance Test Set. Filed Feb. 14, 1961. Patented June 22, 1965. Not available NTIS.

Patent 3,191,962. Articulating Heavy Equipment Transporter. Filed Nov. 1, 1963. Patented June 29, 1965. Not available NTIS.

Patent 3,192,411. Pulse Generator Using a Dual Frequency Oscillator to Both Develop and Switch High Voltage. Filed July 3, 1961. Patented June 29, 1965. Not available NTIS.

Patent 3,193,227. Antenna Mount. Filed Aug. 30, 1962. Patented July 6, 1965. Not available NTIS.

Patent 3,193,678. Method of Improving Properties of an Alloy by Radiation. Filed Aug. 14, 1962. Patented July 6, 1965. Not available NTIS.

Patent 3,195,259. Trigger Guard Safety for Dual Trigger Firearms. Filed Feb. 15, 1965. Patented July 20, 1965. Not available NTIS.

Patent 3,196,459. Closure Means for a Protective Garment. Filed May 1, 1962. Patented July 27, 1965. Not available NTIS.

Patent 3,196,871. Diffusion Type Protective Enclosure. Filed Feb. 4, 1958. Patented July 27, 1965. Not available NTIS.

Patent 3,196,991. Mast. Filed May 4, 1962. Patented July 27, 1965. Not available NTIS.

Patent 3,197,103. Loop Sensing Switch. Filed May 20, 1963. Patented July 27, 1965. Not available NTIS.

Patent 3,197,334. Method of Coating a Substrate with Magnetic Ferrite Film. Filed Nov. 6, 1962. Patented July 27, 1965. Not available NTIS.

Patent 3,197,637. High Intensity Gamma Insensitive Neutron Dosimeter. Filed July 2, 1962. Patented July 27, 1965. Not available NTIS.

Patent 3,199,024. Apparatus and Method for Determining the Impedance of a Component in a Complex Network without Removing the Component from the Network. Filed Oct. 4, 1961. Patented Aug. 3, 1965. Not available NTIS.

Patent 3,199,221. Apparatus for Use in Freeze Dehydration. Filed Apr. 20, 1962. Patented Aug. 10, 1965. Not available NTIS.

Patent 3,201,296. Method of Making a Waveguide Window. Filed Mar. 5, 1963. Patented Aug. 17, 1965. Not available NTIS.

Patent 3,201,838. Rope Coupling. Filed Mar. 18, 1964. Patented Aug. 24, 1965. Not available NTIS.

Patent 3,202,548. Reserve Type Electrochemical Battery. Filed Aug. 30, 1962. Patented Aug. 24, 1965. Not available NTIS.

Patent 3,202,846. Piezoelectric Crystal Element. Filed Apr. 3, 1963. Patented Aug. 24, 1965. Not available NTIS.

Patent 3,202,946. Wave Guide Connector. Filed Oct. 21, 1963. Patented Aug. 24, 1965. Not available NTIS.

Patent 3,204,649. Personnel Door for Air Supported Tents. Filed Aug. 9, 1963. Patented Sept. 7, 1965. Not available NTIS.

Patent 3,206,776. Insulated Air Mattress. Filed Oct. 19, 1962. Patented Sept. 21, 1965. Not available NTIS.

Patent 3,207,680. Method of Electrodepositing Iridium. Filed May 3, 1962. Patented Sept. 21, 1965. Not available NTIS.

Patent 3,208,069. Antenna with Controlled Voltage Distribution. Filed Apr. 5, 1962. Patented Sept. 21, 1965. Not available NTIS.

Patent 3,208,879. Electric Storage Device. Filed Feb. 6, 1963. Patented Sept. 28, 1965. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Chief, Research Agreements and Patent Mgmt. Branch, Federal Bldg., General Services Division, Agricultural Research Service, Hyattsville, Md. 20782

Patent 3,856,710. Nickel/Copper Chromite Catalysts for Hydrogenating Edible Oils. Filed Feb. 4, 1974. Patented Dec. 24, 1974. Not available NTIS.

Patent 3,857,678. Method of Determining Toxicity of Phytotoxins in Plants. Filed Feb. 21, 1973. Patented Dec. 31, 1974. Not available NTIS.

ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

Assistant General Counsel for Patents, Washington, D.C. 20545

Patent application 503,537. Process for Pretreatment of Coal During Transport to Reduce Agglomeration. Filed Sept. 5, 1974. PC $3.25/MF $2.25.

Patent 3,867,017. Apodised Aperture Assembly for High Power Lasers. Filed Nov. 27, 1973. Patented Feb. 18, 1975. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch, Westwood Building, Bethesda, Md. 20014

Patent 3,879,503. Scintillation Analysis System. Filed Aug. 2, 1973. Patented Apr. 22, 1975. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts. NW., Washington, D.C. 20240

Patent application 498,790. Sulfur Recovery from H_2S and/or SO_2 Containing Gases by Liquid Absorption and Reaction Over Solid Catalyst. Filed Aug. 19, 1974. PC $3.25/MF $2.25.

Patent application 501,550. Scale Inhibition. Filed Aug. 29, 1974. PC $3.25/MF $2.25.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

Patent 3,878,464. Modulator for Tone and Binary Signals. Patented Apr. 15, 1975. Not available NTIS.

Patent 3,883,872. System for Interference Signal Nulling by Polarization Adjustment. Patented May 13, 1975. Not available NTIS.

DEPARTMENT OF THE ARMY

Chief, Patents Division, Office of Judge Advocate General, Patent Division, Room 2C–455, Pentagon, Washington, D.C. 20310

Patent 3,187,834. Muffler Having Spaced Frusto-Conical Baffle Plates with Perforated Center Tube and Attached Cooling Fins. Filed Mar. 29, 1963. Patented June 8, 1965. Not available NTIS.

Patent 3,188,618. Positive Lockout Control for Oil and Water Baths. Filed May 21, 1962. Patented June 8, 1965. Not available NTIS.

Patent 3,189,420. Electrically Conductive Element. Filed Oct. 1, 1962. Patented June 15, 1965. Not available NTIS.

Patent 3,189,441. Magnesium-Lithium-Thorium Alloys. Filed May 27, 1963. Patented June 15, 1965. Not available NTIS.

Patent 3,189,550. Process of Making Ferrite Magnetic Core Material. Filed Mar. 7, 1961. Patented June 15, 1965. Not available NTIS.

Patent 3,189,644. C406 Perfluorinated Glycol Diesters of Trimethylacetic Acid. Filed Feb. 25, 1963. Patented June 15, 1965. Not available NTIS.

Patent 3,189,669. Process for Shipping Flexible Polyurethane Foam. Filed Nov. 1, 1962. Patented June 15, 1965. Not available NTIS.

Patent 3,189,837. Pulse Generator Employing Plural Pulse Forming Networks Providing Overlapped Pulses to Effect Ripple Cancellation. Filed Mar. 14, 1963. Patented June 15, 1965. Not available NTIS.

Patent 3,189,844. Search Sweep Oscillator Comprising One or More Three Electrode Transistors and a Double Base Diode. Filed June 7, 1962. Patented June 15, 1965. Not available NTIS.

Patent 3,190,299. Air-Supported Building Structure. Filed Mar. 1, 1963. Patented June 22, 1965. Not available NTIS.

Patent 3,190,416. Clutch and Brake Positioning Device. Filed Nov. 29, 1963. Patented June 22, 1965. Not available NTIS.

Patent 3,190,588. Aircraft Canopy Actuator. Filed Apr. 3, 1964. Patented June 22, 1965. Not available NTIS.

DEPARTMENT OF THE AIR FORCE

AF/JACP, Washington, D.C. 20314

Patent 3,886,478. Multi-Component Flow Injector Pump for a Flowing Gas Laser with Low Output Pressure. Filed Nov. 5, 1973. Patented May 27, 1975. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Chief, Research Agreements and Patent Mgmt. Branch, Federal Bldg., General Services Division, Agricultural Research Service, Hyattsville, Md. 20782

Patent 3,858,277. Spiral Carding Apparatus. Filed Oct. 26, 1973. Patented Jan. 7, 1975. Not available NTIS.

Patent 3,867,041. Method for Detecting Bruises in Fruit. Filed Dec. 3, 1973. Patented Feb. 18, 1975. Not available NTIS.

Patent 3,873,326. Concrete-Curing and Antispalling Compositions. Filed June 1, 1973. Patented Mar. 25, 1975. Not available NTIS.

ENERGY RESEARCH AND DEVELOPMENT ADMNISTRATION

Assistant General Counsel for Patents, Washington, D.C. 20545

Patent application 528,880. Insensitive Explosive. Filed Nov. 29, 1974. PC $3.25/MF $2.25.

Patent 3,501,337. Tungsten Seal Coat. Filed Dec. 27, 1966. Patented Mar. 17, 1970. Not available NTIS.

Patent 3,579,028. Converging-Barrel Plasma Accelerator. Filed Oct. 23, 1968. Patented May 18, 1971. Not available NTIS.

Patent 3,624,241. Method and Apparatus for Controlling Thermal Nuclear Reactors. Filed Feb. 10, 1970. Patented Nov. 30, 1971. Not available NTIS.

Patent 3,864,089. Multiple-Sample Rotor Assembly for Blood Fraction Preparation. Filed Dec. 10, 1973. Patented Feb. 4, 1975. Not available NTIS.

Patent 3,864,219. Process and Electrolyte for Applying Barrier Layer Anodic Coatings. Filed Jan. 8, 1974. Patented Feb. 4, 1975. Not available NTIS.

Patent 3,865,614. Method for Coating Uranium Impregnated Graphite with Zirconium Carbide. Filed Apr. 2, 1959. Patented Feb. 11, 1975. Not available NTIS.

Patent 3,865,709. Carbon Activity Meter. Filed Nov. 2, 1973. Patented Feb. 11, 1975. Not available NTIS.

Patent 3,867,185. Method of Producing a Lithium-Depleted Patterned Surface on a Lithium Niobate Crystal. Filed Sept. 17, 1973. Patented Feb. 18, 1975. Not available NTIS.

Patent 3,867,489. Method of Producing an Oxidation-Resistant UO_2 Fuel Body. Filed July 17, 1962. Patented Feb. 18, 1975. Not available NTIS.

Patent 3,867,704. Magazine for Handling Stripping Foils in a Particle Accelerator. Filed May 30, 1974. Patented Feb. 18, 1975. Not available NTIS.

Patent 3,867,705. Cyclotron Internal Ion Source with DC Extraction. Filed Mar. 29, 1974. Patented Feb. 18, 1975. Not available NTIS.

Patent 3,868,507. Field Desorption Spectrometer. Filed Dec. 5, 1973. Patented Feb. 25, 1975. Not available NTIS.

Patent 3,869,255. Closed Loop Reflux System. Filed Jan. 10, 1973. Patented Mar. 4, 1975. Not available NTIS.

Patent 3,869,256. Continuous Fluid Bed Reactor for Fissionable Material. Filed Sept. 28, 1972. Patented Mar. 4, 1975. Not available NTIS.

Patent 3,869,610. Method of Determining the Amount of an Isotopic Mixture of Noble Gases Present as a Tab in a nuclear Reactor Fuel Element. Filed Jan. 8, 1974. Patented Mar. 4, 1975. Not available NTIS.

Patent 3,873,651. Freeze Drying Method for Preparing Radiation Source Material. Filed May 12, 1972. Patented Mar. 25, 1975. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch, Westwood Building, Bethesda, Md. 20014

Patent 3,886,132. Human Parathyroid Hormone. Filed Dec. 10, 1973. Patented May 27, 1975. Not available NTIS.

TENNESSEE VALLEY AUTHORITY
Division of Law, Muscle Shoals, Ala. 35660

Patent 3,877,415. Apparatus for Applying Coatings to Solid Particles. Filed Feb. 1, 1974. Patented Apr. 15, 1975. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

Patent application 571,459. Iodine Generator for Reclaimed Water Purification. Filed Apr. 25, 1975. PC $3.25/MF $2.25.

Patent application 572,784. Process for Preparing Low Density Polybenzimidazole Foams. Filed Apr. 29, 1975. PC $3.25/MF $2.25.

Patent application 576,767. Magnetic Tape Head Function Switching System. Filed May 12, 1975. PC $3.25/MF $2.25.

Patent application 576,774. High Speed Data Monitoring Apparatus. Filed May 12, 1975. PC $3.25/MF $2.25.

Patent application 578,241. Catheter Tip Force Transducer for Cardiovascular Research. Filed May 16, 1975. PC $3.25/MF $2.25.

Patent application 582,485. Sustained Arc Ignition System. Filed June 3, 1975. PC $3.25/MF $2.25.

Patent application 583,487. Therapeutic Hand Exerciser. Filed June 3, 1975. PC $3.25/MF $2.25.

Patent 3,874,240. Heat Detection and Compositions and Devices Therefor. Patented Apr. 1, 1975. Not available NTIS.

Patent 3,874,635. Ultrasonically Bonded Valve Assembly. Patented Apr. 1, 1975. Not available NTIS.

Patent 3,875,435. Heat Operated Cryogenic Electrical Generator. Patented Apr. 1, 1975. Not available NTIS.

Patent 3,877,833. Hole Cutter. Patented Apr. 15, 1975. Not available NTIS.

Patent 3,882,530. Radiation Hardening of MOS Devices by Boron. Patented May 6, 1975. Not available NTIS.

Patent 3,882,634. Rotary Plant Growth Accelerating Apparatus. Patented May 13, 1975. Not available NTIS.

Patent 3,882,719. Device for Use in Loading Tension Members. Patented May 13, 1975. Not available NTIS.

Patent 3,882,732. Material Suspension Within an Acoustically Excited Resonant Chamber. Patented May 13, 1975. Not available NTIS.

Patent 3,882,846. Insulated Electrocardiographic Electrodes. Patented May 13, 1975. Not available NTIS.

Patent 3,883,095. Reversed Cowl Flap Inlet Thrust Augmentor. Patented May 13, 1975. Not available NTIS.

Patent 3,883,215. Holographic System for Nondestructive Testing. Patented May 13, 1975. Not available NTIS.

Patent 3,883,436. Physical Correction Filter for Improving the Optical Quality of an Image. Patented May 13, 1975. Not available NTIS.

Patent 3,883,689. Servo-Controlled Intravital Microscope System. Patented May 13, 1975. Not available NTIS.

Patent 3,883,785. Low Speed Phaselock Speed Control System. Patented May 13, 1975. Not available NTIS.

Patent 3,883,812. Diode-Quad Bridge Circuit Means. Patented May 13, 1975. Not available NTIS.

Patent 3,883,817. Digital Phase-Locked Loop. Patented May 13, 1975. Not available NTIS.

DEPARTMENT OF THE ARMY
Chief, Patents Division, Office of Judge Advocate General, Patent Division, Room 2C–455, Pentagon, Washington, D.C. 20310

Patent 3,183,457. Ferrite Power Limiter Duplexer. Filed Apr. 18, 1960. Patented May 11, 1965. Not available NTIS.

Patent 3,183,990. Multiple Track Steering Application for a Plurality of Vehicles. Filed Jan. 29, 1963. Patented May 18, 1965. Not available NTIS.

Patent 3,185,165. Baffle Vent for Air Supported Building. Filed May 7, 1964. Patented May 25, 1965. Not available NTIS.

Patent 3,185,928. Pulse Generator Employing Plural Pulse-Forming-Networks With Pulse Producing Means for Cancellation of Undesirable Reflected Pulse. Filed May 24, 1963. Patented May 25, 1965. Not available NTIS.

Patent 3,185,945. Amplified Microwave Power Limiter. Filed Dec. 2, 1960. Patented May 25, 1965. Not available NTIS.

Patent 3,187,709. Adjustable Height Propeller and Drive Assembly. Filed Mar. 15, 1963. Patented June 8, 1965. Not Available NTIS.

Patent 3,187,834. Muffler Having Spaced Frusto-Conical Baffle Plates with Perforated Center Tube and Attached Cooling Fins. Filed Mar. 29, 1963. Patented June 8, 1965. Not available NTIS.

Patent 3,187,970. Cycle Timing Mechanism. Filed May 20, 1963. Patented June 8, 1965. Not available NTIS.

DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent application 570,746. Multiple Level Fluid Bearing Track Assembly. Filed May 21, 1975. PC $3.25/MF $2.25.

Patent application 578,835. Coining Friction Rings. Filed May 19, 1975. PC $3.25/MF $2.25.

Patent application 578,836. Two's Complement Subtracting System. Filed May 19, 1975. PC $3.25/MF $2.25.

Patent application 578,845. Laser Velocimeter Real Time Digital Data Analyzer. Filed May 19, 1975. PC $3.25/MF $2.25.

Patent application 578,846. Addition Curable Phenyl-Quinoxaline Compositions and Their Synthesis. Filed May 19, 1975. PC $3.25/MF $2.25.

Patent application 578,847. Ethynyl-Substituted Aromatic Ortho Diamines and Method of Synthesis. Filed May 19, 1975. PC $3.25/MF $2.25.

Patent 3,886,478. Multi-Component Flow Injector Pump for a Flowing Gas Laser with Low Output Pressure. Filed Nov. 5, 1973. Patented May 27, 1975. Not available NTIS.

ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
Assistant General Counsel for Patents, Washington, D.C. 20545

Patent application 527,469. Method for Localizing Heating in Tumor Tissue. Filed Nov. 26, 1974. PC $3.25/MF $2.25.

Patent application 528,382. Method for Preparing Superconductors. Filed Nov. 29, 1974. PC $3.25/MF $2.25.

Patent 3,864,041. Doppler-Shift Velocity Measurement System Using a Two-Frequency Laser. Filed June 6, 1973. Patented Feb. 4, 1975. Not available NTIS.

Patent 3,864,233. Uranium-Sensitive Electrode Membrane. Filed Dec. 17, 1973. Patented Feb. 4, 1975. Not available NTIS.

Patent 3,865,746. UO^2 BeO Fuel Process. Filed July 16, 1959. Patented Feb. 11, 1975. Not available NTIS.

Patent 3,865,801. Stabilization of Urinary Erythropoietin Using Sodium P-Aminosalicylate and Extracting Into Phenol. Filed June 15, 1973. Patented Feb. 11, 1975. Not available NTIS.

Patent 3,866,132. Moving Foil Stripper for a Particle Accelerator. Filed May 30, 1974. Patented Feb. 11, 1975. Not available NTIS.

Patent 3,866,424. Heat Source Containing Radioactive Nuclear Waste. Filed May 3, 1974. Patented Feb. 18, 1975. Not available NTIS.

Patent 3,867,137. Purification of Iridium. Filed June 22, 1973. Patented Feb. 18, 1975. Not available NTIS.

Patent 3,867,176. Method for Plating Race-Type Assemblies. Filed Oct. 12, 1973. Patented Feb. 18, 1975. Not available NTIS.

Patent 3,867,510. Process for Recovering Uranium and Plutonium from Irradiated Nuclear Fuel Oxides. Filed Apr. 23, 1973. Patented Feb. 18, 1975. Not available NTIS.

Patent 3,868,333. Technetium Catalyst for Hydrocarbon Reforming. Filed Nov. 20, 1973. Patented Feb. 25, 1975. Not available NTIS.

Patent 3,872,565. Reactor Vessel Seal Service Fixture. Filed May 9, 1974. Patented Mar. 25, 1975. Not available NTIS.

Patent 3,872,909. Method of Desalinating Salt Water. Filed Jan. 10, 1972. Patented Mar. 25, 1975. Not available NTIS.

Patent 3,873,217. Simplified Rotor for Fast Analyzer of Rotary Cuvette Type. Filed July 24, 1973. Patented Mar. 25, 1975. Not available NTIS.

Patent 3,873,447. Cold Trap for Liquid Sodium Impurities Collection. Filed Dec. 21, 1973. Patented Mar. 25, 1975. Not available NTIS.

Patent 3,873,838. Two-Dimensional Readout System for Radiation Detector. Filed Apr. 22, 1974. Patented Mar. 25, 1975. Not available NTIS.

Patent 3,873,839. High Speed Linac-Beam Analyzer. Filed Apr. 10, 1974. Patented Mar. 25, 1975. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements & Patent Mgmt. Branch,
General Services Division, Federal Bldg.,
Agricultural Research Service,
Hyattsville, Md. 20782

Patent 3,800,375. Cross Dyeing Fiber Blends of Polyurethane, Polyacrylate or Butadiene-Acrylonitrile Copolymer Coated Cotton Fibers with Disperse and Reactive Dyes. Filed Nov. 5, 1971. Patented Apr. 2, 1974. Not available NTIS.

Patent 3,835,638. Process for Producing Core Yarn. Filed Mar. 15, 1972. Patented Sept. 17, 1974. Not available NTIS.

Patent 3,839,823. Method of Chemically Inducing Lightwood Formation in Pine Trees. Filed Sept. 7, 1973. Patented Oct. 8, 1974. Not available NTIS.

U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

Assistant General Counsel for Patents,
Washington, D.C. 20545

Patent application 459,991. Energy Conversion System. Filed Apr. 11, 1974. PC $3.25/MF $2.25.

Patent application 517,678. Reducing Gain Shifts in Photomultiplier Tubes. Filed Oct. 24, 1974. PC $3.25/MF $2.25.

Patent application 519,325. High-Explosive Driven Crowbar Switch. Filed Oct. 30, 1974. PC $3.25/MF $2.25.

Patent 3,859,145. Passivation of Brazed Joints to Fluorinating Atmospheres. Filed Nov. 8, 1973. Patented Jan. 7, 1975. Not available NTIS.

Patent 3,589,625. Torus Windings Having Asymmetric Magnet Coils. Filed July 30, 1973. Patented Jan. 7, 1975. Not available NTIS.

Patent 3,860,890. Temperature Stable RC Oscillator. Filed Jan. 2, 1974. Patented Jan. 14, 1975. Not available NTIS.

Patent 3,861,944. Method of Making Corrosion Resistant Concrete Articles. Filed Nov. 6, 1972. Patented Jan. 21, 1975. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch,
Westwood Bldg., Bethesda, Md. 20014

Patent application 563,378. One Handed Syringe. Filed Mar. 27, 1975. PC $3.25/MF $2.25.

Patent application 567,718. Laboratory Mouse Feeder. Filed Apr. 14, 1975. PC $3.25/MF $2.25.

Patent application 571,214. Radiation Safety Shield Syringe. Filed Apr. 24, 1975. PC $3.25/MF $2.25.

Patent 3,872,225. Process of Viral Diagnosis and Reagent. Filed July 12, 1972. Patented Mar. 18, 1975. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research,
Code 302, Arlington, Va. 22217

Patent application 435,786. Universal Shock and Vibration Mounts. Filed Jan. 23, 1974. PC $3.25/MF $2.25.

Patent application 546,370. Porpoise Stranding Device. Filed Feb. 3, 1975. PC $3.25/MF $2.25.

Patent application 550,067. Fluid for Filing Sonar Transducers. Filed Feb. 14, 1975. PC $3.25/MF $2.25.

Patent application 553,208. Circulation Controlled Rotary Wing Aircraft and Control System Therefor. Filed Feb. 26, 1975. PC $3.25/MF $2.25.

Patent application 557,191. Noise Riding Threshold. Filed Mar. 10, 1975. PC $3.25/MF $2.25.

Patent application 558,040. Biodegradation of Oil on Water Surfaces. Filed Mar. 13, 1975. PC $3.25/MF $2.25.

Patent application 559,360. Production of Beryllium Reinforced Composite Solid and Hollow Shafting. Filed Mar. 17, 1975. PC $3.25/MF $2.25.

Patent application 561,022. Multi-Porro Reflector. Filed Mar. 21, 1975. PC $3.35/MF $2.25.

Patent application 566,459. Convertible Canopy-to-Wing Shaped Parachute. Filed Apr. 9, 1975. PC $3.25/MF $2.25.

Patent application 567,661. Synthetic Motion Generator. Filed Apr. 14, 1975. PC $3.75/MF $2.25.

Patent 3,859,620. Hydrophone Line Array Calibration Unit. Filed Jan. 23, 1974. Patented Jan. 7, 1975. Not available NTIS.

Patent 3,860,892. Cascade Transversal Filter Amplitude-Compensation Network. Filed Feb. 25, 1974. Patented Jan. 14, 1975. Not available NTIS.

Patent 3,867,715. Underwater Communications System. Filed Nov. 8, 1973. Patented Feb. 18, 1975. Not available NTIS.

Patent 3,867,836. Crack Detection Apparatus and Method. Filed Mar. 26, 1973. Patented Feb. 25, 1975. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA—
Code GP–2, Washington, D.C. 20546

Patent application 555,750. Thermal Insulation Attaching Means. Filed Mar. 5, 1975. PC $3.25/MF $2.25.

Patent application 558,600. Window Defect Planar Mapping Technique. Filed Mar. 14, 1975. PC $3.25/MF $2.25.

Patent application 565,162. Method and Apparatus for Providing a Servodrive Signal in a High Speed Stepping Interferometer. Filed Apr. 4, 1975. PC $3.75/MF $2.25.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 28, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-30-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-3-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Fore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-13-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-28-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-16-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	1-2-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	3-17-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-5-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-29-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-5-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	12-12-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	4-1-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	6-3-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-4-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-28-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	8-5-75

Expiration of patents: The patents within the range of numbers indicated below expire during March 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 82nd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,875,445 to 2,880,418 inclusive
Plant Patents..... Numbers 1,814 to 1,824 inclusive

PATENT APPLICATIONS

PUBLISHED MARCH 23, 1976
UNDER THE SECOND TRIAL VOLUNTARY PROTEST PROGRAM

NOTE- A copy of the notice setting forth the details of the Second Trial Voluntary Protest Program may be found in the Patent and Trademark Notices section of this issue.

Any protests relating to the patentability of these published applications must be filed in writing before June 23, 1976. These applications are available for inspection in the Allowed Files Branch, Crystal Plaza, Room 2-10C28. All correspondence should be addressed to:

Commissioner of Patents and Trademarks
Box TVPP
Washington, D.C. 20231

Printed copies of the published applications may be purchased from the Patent and Trademark Office at 50 cents each.

An "Index of Applicants and Assignees of Published Applications" and a concordance entitled "Classification of Published Patent Applications" are located in the back of this issue.

GENERAL AND MECHANICAL APPLICATIONS

B 405,899
EXHAUST GAS RECIRCULATION DEVICE

Hisanori Moriya, and Tadao Osawa, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 12, 1973, Ser. No. 405,899
Int. Cl.² F02M *25/06*

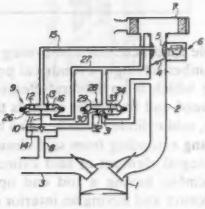
U.S. Cl. 123—119 A **4 Claims**

References Cited
UNITED STATES PATENTS

3,491,736	1/1970	Walker	123/119 A
3,507,260	4/1970	Walker	123/119 A
3,739,797	6/1973	Caldwell	123/119 A
3,774,583	11/1973	King	123/119 A
3,818,880	6/1974	Dawson	123/119 A

FOREIGN PATENTS OR APPLICATIONS

1,601,374	4/1970	Germany	123/119 A



1. In an exhaust gas recirculation device including an exhaust gas recirculation passage through which a portion of exhaust gas discharged from an engine exhaust system is recirculated to a carburetor throttle valve for removing nitrogen oxides from the exhaust gas of the engine, the recirculation device comprising flow control valve means arranged in the exhaust gas recirculation passage for responding to the negative pressure in a carburetor venturi to vary the cross-sectional area of the recirculation passage, and pressure control valve means disposed on the downstream side of said flow control valve means for keeping substantially constant the pressure in a portion of the recirculation passage on the downstream side of said flow control valve means.

B 410,694
SHAKING MACHINE

Robert D. Gunn, 1471 Akins Road, Broadview Heights, Ohio 44141

Filed Oct. 29, 1973, Ser. No. 410,694
Int. Cl.² F15B *21/02*

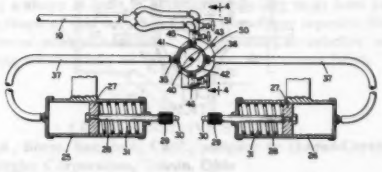
U.S. Cl. 91—40 **9 Claims**

References Cited
UNITED STATES PATENTS

1,006,228	10/1911	Kirkus	91/39 X
1,080,884	12/1913	Birchett	91/467 X
1,503,922	8/1924	Slater	60/370
2,475,313	7/1949	Davis	91/40 X
2,773,482	12/1956	Dickie	121/20
2,992,636	7/1961	Sampietro	91/39 X
3,023,738	3/1962	Burgess, Jr.	121/17
3,028,050	4/1962	Nelson	137/624.15 X
3,215,042	11/1965	Holley, Jr.	91/36
3,237,641	3/1966	Audemar	91/40 X
3,333,894	8/1967	Frellsen	91/40 X
3,372,621	3/1968	Colosimo	91/36
3,399,698	9/1968	Bentley	137/624.15
3,514,227	5/1970	Rupp	60/370 X
3,616,979	11/1971	Titcomb	91/40 X

FOREIGN PATENTS OR APPLICATIONS

118,770	8/1958	U.S.S.R.	259/DIG. 43



1. A shaking machine comprising:
a rotary valve having a circular valve chamber in which a valve element can rotate,
an air inlet and an air exhaust in the circular wall of the valve chamber and a pair of outlets in other locations of the circular wall,
a source of compressed air connected to the air inlet,
a rotating valve element separating the air inlet from one outlet at the same position in which it separates the air exhaust from the other outlet,
power means for continuous rotation of the valve element,
a pair of conduits, each connected to a different one of the air outlets,
a pair of coaxial cylinders each closed at the end most distant from the other cylinder, and each communicating with a different one of the conduits, and

a pair of piston faces, each slidable in one cylinder and biased toward the other when compressed air is admitted to the respective cylinder, for motion in unison when a solid movable structure is interposed between the piston faces.

B 412,124

COMPRESSED OIL BURNER STARTING MECHANISM

Johan Holger Graffman, Danderyd, Sweden, assignor to Clean Air Company, Inc., Panama

Filed Nov. 2, 1973, Ser. No. 412,124

Claims priority, application Sweden, Nov. 3, 1972, 14262/72

Int. Cl.² F23C *3/02*

U.S. Cl. 431—1 **6 Claims**

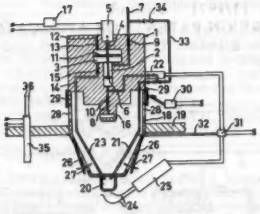
References Cited

UNITED STATES PATENTS

1,631,984	6/1927	Redmond	123/139 AW
3,194,162	7/1965	Williams	239/102
3,221,798	12/1965	Kofink	236/1 A
3,411,704	11/1968	Hilgert et al.	417/326

FOREIGN PATENTS OR APPLICATIONS

421,011	5/1947	Italy	123/52 MF
1,293,753	4/1962	France	431/1
1,236,674	6/1960	France	431/1
1,171,550	6/1964	Germany	431/1
1,063,300	3/1967	United Kingdom	431/1
1,361,886	4/1964	France	431/1
807,978	3/1969	Canada	431/1



1. In a compressed oil burner, having an operating nozzle comprising a valve body, which is yieldingly loaded against a valve seat in a direction contrary to the flow direction of the fuel, said fuel being supplied at a pulsating pressure, the improvement comprising a separate starting nozzle means arranged in front of said operating nozzle, said starting nozzle means being comprised of an air-fuel mixing chamber with outflow apertures and fuel and combustion air introduction means so that fuel and combustion air are supplied to said chamber while the fuel supply to said operating nozzle is closed.

B 425,193

DISPOSABLE FLUID ACTUATOR

Rodney R. Erickson, Joliet; Melvin H. Peters, Minooka, and Daniel L. McMillan, Morris, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 17, 1973, Ser. No. 425,193

Int. Cl.² F16J *11/02*; F01B *29/00*

U.S. Cl. 92—163 **1 Claim**

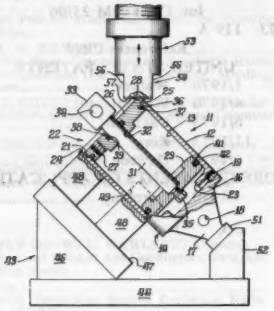
References Cited

UNITED STATES PATENTS

2,487,262	11/1949	Mueller	92/118
2,865,215	12/1958	Bishop	92/165 R
3,040,712	6/1962	Harrah	92/170
3,211,348	10/1965	Greer	222/386.5
3,251,434	5/1966	Roenick	181/36
3,259,147	7/1966	Mercier et al.	138/30
3,650,182	3/1972	Phillips	92/169
3,811,367	5/1974	Bimba	92/169

FOREIGN PATENTS OR APPLICATIONS

1,555,323	3/1973	Germany	92/130
1,154	11/1903	United Kingdom	92/170



1. A disposable fluid actuator comprising:

a cylinder member having a cylindrical portion and a head end closure which is an integral element therewith and wherein a head end fluid port extends through said head end closure, said cylinder member also having a head end mounting tang extending from said closure, said tang also being an integral element of said cylinder member, said cylinder member having a rod end opposite from said head end closure and having an interior cylindrical chamber extending from said rod end towards said closure and also having a shorter counterbore extending inward from said rod end, said counterbore being of greater diameter than said interior chamber to form an annular shoulder in conjunction therewith which shoulder faces said rod end,

a circular end cap disposed within said rod end of said cylinder member in coaxial relationship therewith, said end cap having a stepped peripheral surface forming an annular shelf which abuts said shoulder of said cylinder member, said end cap being held therein by a plurality of radially inwardly extending deformed portions of said rod end of said cylinder member, said end cap having a central opening therethrough for a piston rod, said end cap further having a rod end fluid port extending therethrough,

a piston rod extending into said cylinder member through said opening of said end cap, and

a piston disposed coaxially in said chamber for axial movement therewith, said piston being secured to said piston rod,

said end cap and said piston rod and said piston being permanently secured to said cylinder member by said radially inwardly extending portions of said rod end of said cylinder member.

B 430,326

FIELD DRESSABLE INFLATABLE PACKER

Stanley O. Hutchison, Bakersfield, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 367,602, June 6, 1973, and a continuation-in-part of Ser. No. 423,593, Dec. 10, 1973. This application Jan. 2, 1974, Ser. No. 430,326

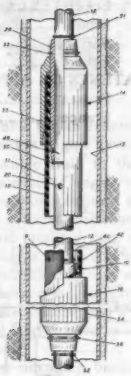
Int. Cl.² F16J 15/46

U.S. Cl. 277—34.6 3 Claims

References Cited

UNITED STATES PATENTS

820,149	5/1906	Spang	277/185
2,098,484	11/1937	Brunred et al.	166/187
2,334,788	11/1943	O'Leary	277/34.6 X
2,611,437	9/1952	Lynes	166/187 X
2,643,722	6/1953	Lynes et al.	166/187 X
2,671,510	3/1954	Slick et al.	166/187 X
2,778,432	1/1957	Allen	166/187 UX
3,280,916	10/1966	Barrington	166/187 X
3,598,126	8/1971	Hoeltzenbein	138/177
3,642,291	2/1972	Zeffer	277/34



1. A field dressable inflatable packer comprising an inner tubing section, an elongated resilient sleeve element positioned over said tubing section and forming an annular chamber with said tubing section, said sleeve element comprising an elongated cured rubber tube having incorporated by curing therein at least one circumferential layer formed of from 20 to 40 per inch spaced apart stretchable nylon cord members having a diameter between about 0.002 and 0.005 of an inch and extending only longitudinally over the entire length of said rubber tube and in substantially parallel relationship with the longitudinal axis of said rubber tube and further characterized by the absence of any such cord member in said rubber tube transverse to said longitudinal axis of said rubber tube, clamp means slideably positioned on said tubing section connecting the ends of said sleeve element in fluidtight relationship with said tubing section, removable constraining means for constraining said clamp means in a predeterminable position on said tubing section and port means in said tubing section for injecting fluid into said annular chamber for inflating said sleeve element.

B 452,034

INSULATION FOR A VEHICLE ROOF

William R. Thomas, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 228,782, Feb. 14, 1972. This application Mar. 18, 1974, Ser. No. 452,034

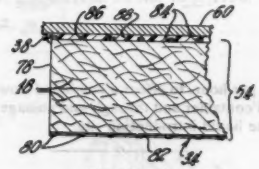
Int. Cl.² B60J 7/00

U.S. Cl. 296—137 A 5 Claims

References Cited

UNITED STATES PATENTS

1,926,737	9/1933	Blum	296/31 R X
2,110,492	3/1938	Upson	296/39 A X
2,428,591	11/1947	Slayter	296/137 A X
2,879,105	3/1959	Stahl	296/137 A
3,097,015	7/1963	Nagel	296/137 A
3,265,530	8/1966	Marzocchi	296/137 A X
3,620,906	11/1971	Hannes	296/137 A X



1. In combination, a vehicle roof panel, adhesive extending over a substantial portion of a lower surface of said roof panel, a compressible, flexible layer of glass fibers held together by a binder, said layer being of substantially uniform thickness and having a shape at least in part corresponding to at least part of the shape of said roof panel, an upper, non-woven, porous fabric adhered to the upper surface of said layer, with a portion of said adhesive extending through interstices in said porous fabric and into contact with fibers of said layer to adhere said layer to the lower surface of said panel with said porous fabric serving as a net-like reinforcement in the adhesive, a lower, cloth-like, non-woven fabric adhered to the lower surface of said layer by the same binder which holds the glass fibers together, said lower, non-woven fabric extending substantially over the entire surface of said layer and also having a shape at least in part corresponding to at least part of the shape of said roof panel, and a headliner separate from said lower, non-woven fabric and located therebelow and covering substantially all of said lower, non-woven fabric.

B 463,473

LEVEL-SENSITIVE SYSTEM

John A. Borst, San Jose, Calif., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 24, 1974, Ser. No. 463,473

Int. Cl.² G01F 23/16

U.S. Cl. 73—302 1 Claim

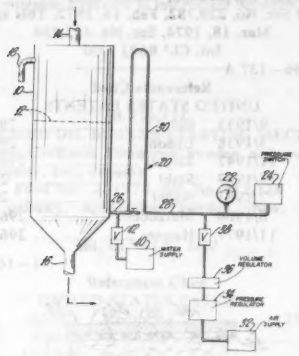
References Cited

UNITED STATES PATENTS

1,442,400	1/1923	Green	73/299
2,553,918	5/1951	Hofer	73/302 X
2,956,581	10/1960	Pearson	73/299 X
3,048,037	8/1962	Melchior	73/299
3,422,682	1/1969	Evans et al.	73/299 X
3,613,456	10/1971	Hopfe et al.	73/302 X
3,751,185	8/1973	Gottliebson et al.	73/299 X

1. In combination, a container for a liquid, the level of which is subject to rising and falling, a device sensitive to the level of the liquid in the container, passage means connecting the device to a lower portion of said container, means for supplying gas under pressure to said passage means to effect

a flow of gas into said container through said passage means, and means for supplying liquid under pressure through said passage means to said container, at a rate of 10 cc per minute



to 2 gallons per hour, to effect a combined flow of liquid and gas into said container and through said passage means downstream of the liquid introduction site.

B 470,853
FIREARMS

Paul E. Tellie, 20 rue Bergson, 42000 Saint-Etienne, France

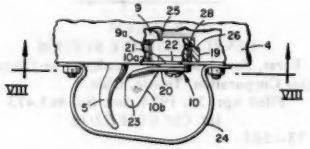
Filed May 17, 1974, Ser. No. 470,853
Claims priority, application France, May 29, 1973, 73.19393
Int. Cl.[2] F41C *17/02*; F41D *11/02*
U.S. Cl. 89—142 **7 Claims**

References Cited
UNITED STATES PATENTS

1,441,807	1/1923	Horan	89/142
1,561,756	11/1925	Tucker	89/142
2,195,693	4/1940	Clifton	42/70 E
2,371,012	3/1945	Woodhull	89/142
2,863,359	12/1958	Kunz	89/142
2,881,547	4/1959	Butler	42/70 E
3,045,555	7/1962	Stoner	89/142
3,713,242	1/1973	Seifried	89/142

FOREIGN PATENTS OR APPLICATIONS

441,352	3/1927	Germany	89/142



1. An automatic firearm comprising:
a trigger, and
a firing selector positioned adjacent said trigger, said firing selector comprising an inner part cooperating with a mechanism of the firearm and an outer part actuable by a marksman, said outer part being movable, relative to the vertical plane passing through the longitudinal axis of the firearm, into a central position symmetrical relative to said plane, a right-hand off center position to the right of said plane relative to the front end of the firearm, and a left-hand off-center position to the left of said plane relative to the front end of the firearm, and the central position corresponds to a "safety" position of the firing selector and the two off-center positions correspond to a "burst" position and a "shot-by-shot" position of the firing selector, said firing selector being turnable, said inner part comprising a turning part, said outer part comprising a pivoting part connected to said turning part to control its rotation, and said pivoting part being positioned in front of the trigger and mounted pivotally around a pin which is substantially perpendicular to the longitudinal axis of the firearm.

B 480,251
FUEL FEED DEVICE FOR INTERNAL COMBUSTION ENGINE

Michel Pierlot, Le Pecq, France, assignor to Societe Industrielle de Brevets et d'Etudes, Neuilly-sur-Seine, France

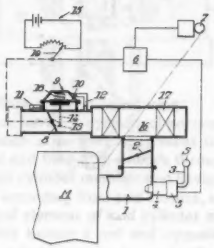
Filed June 17, 1974, Ser. No. 480,251
Claims priority, application France, Aug. 1, 1973, 73.28200
Int. Cl.[2] F02M *39/00*
U.S. Cl. 123—139 AW **5 Claims**

References Cited
UNITED STATES PATENTS

3,286,998	11/1966	Mennesson	123/139 AW
3,288,445	11/1966	Mennesson	123/139 AW
3,404,667	10/1968	Mennesson	123/139 AW
3,703,888	11/1972	Eckert	123/139 AW
3,782,339	1/1974	Scholl	123/139 AW
3,834,679	9/1974	Baribeau	123/139 AW
3,842,813	10/1974	Eckert	123/139 AW

FOREIGN PATENTS OR APPLICATIONS

2,032,021	11/1970	France	123/139 AW
1,309,918	10/1962	France	123/139 AW



1. A fuel feed apparatus for internal combustion engines, comprising: an intake pipe; a main throttle member located in said intake pipe; an auxiliary throttle member located in said intake pipe upstream of said main throttle member; means for progressively opening said auxiliary throttle member proportionally as the flow rate of air in said intake pipe increases; a source of fuel under pressure; a fuel supply circuit coupled to said fuel source and said intake pipe and opening into said pipe downstream of said main throttle member, said supply circuit including at least one solenoid valve for controlling the supply of fuel from said source into said pipe; a metering system coupled to said solenoid valve and to said auxiliary throttle member for providing energizing signals to said solenoid valve, the duration of said signals in a given time period varying proportionally with the amount of opening of said auxiliary throttle member; a chamber located in said intake pipe downstream of said auxiliary throttle member and upstream of said main throttle member; and an air filter located in said chamber wherein air flowing through said chamber circulates across said filter.

B 480,384

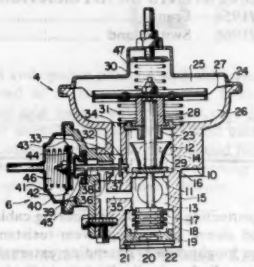
FLOW CONTROL VALVE FOR EXHAUST GAS PURIFYING SYSTEM

Yukihide Hashiguchi, and Ryozo Mitsui, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed June 18, 1974, Ser. No. 480,384
Claims priority, application Japan, July 25, 1973, 48-83052
Int. Cl.² F02B 33/00
U.S. Cl. 251—28 3 Claims

References Cited
UNITED STATES PATENTS

3,507,260	4/1970	Walker	123/119 A
3,756,210	9/1973	Kuehl	123/119 A
3,799,131	3/1974	Bolton	123/119 A
3,834,363	9/1974	Goto et al.	123/119 A



1. A flow control valve for an exhaust gas purifying system for an internal combustion engine having an intake system for conducting a combustible fluid to the engine, said intake system serving as a source of negative pressure, and an exhaust system for conducting exhaust gases from the engine wherein a part of the exhaust gases from said exhaust system is recirculated into said intake system comprising:

a valve casing having a first valve chamber for receiving exhaust gases recirculated from said exhaust system, a second valve chamber for discharging said recirculated gases to said intake system, and a valve seat defining an aperture between said first valve chamber and said second valve chamber;

a first valve means normally biased to closing position against said valve seat;

a first valve control means comprising a first atmospheric chamber communicating with atmosphere, a first pressure chamber, and a first diaphragm disposed between and separating said first atmospheric chamber and said first pressure chamber, said first diaphragm being connected to said first valve means thereby to overcome the bias of said first valve means in response to the difference in pressure between the pressures in said first atmospheric chamber and said pressure chamber;

a passage means comprising a first passage communicating said first valve chamber with said first pressure chamber and a second passage communicating said second valve chamber with said first pressure chamber;

a second valve means disposed in said passage means and normally closing said first passage and opening said second passage simultaneously; and

a second valve control means comprising a second atmospheric chamber communicating with atmosphere, a second atmospheric chamber adapted to communicate with the intake system of an internal combustion engine to receive negative pressure therefrom, and a second diaphragm disposed between and separating said second atmospheric chamber and said second pressure chamber, said second diaphragm being connected to said second valve means, thereby to move said second valve means into such a position as to open said first passage and close said second passage simultaneously at the time when the negative pressure within said second pressure chamber has reached a predetermined value.

B 492,093

TRIANGULAR INTERFEROMETRIC LIGHT-SOURCE TRACKER

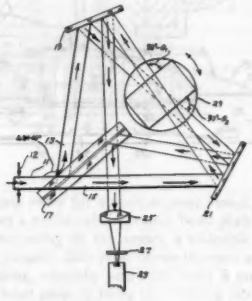
Dennis Kelsall, Concord, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed July 26, 1974, Ser. No. 492,093
Int. Cl.² G01B 9/02; G01D 21/04
U.S. Cl. 356—110 5 Claims

References Cited
OTHER PUBLICATIONS

Hariharan "Cyclic Shearing Interferometer" *Journal of Scientific Instruments*, Vol. 37, p. 374.

Tsuruta, "Measurement of Transfer Functions . . . Shearing Interferometer", JOSA Vol. 53 No. 10 p. 1156.



1. A triangular interferometric tracker of a source light comprising:

a. a gimballed platform;

b. an X-axis and a Y-axis rotational drive means for said platform;

c. means for providing a collimated beam from the light of said source;

d. means for splitting said beam to provide two beams;

e. means for rotating the wavefront of one of the two beams through ninety degrees in space;

f. a triangular interferometer mounted on said gimballed platform with the rotated and non-rotated beams being physically separated beam inputs thereto and with said interferometer producing two separate electrical output signals said signals being the modulation transfer function of each of the beam inputs; and

g. means for producing signals from said two output signals suitable to actuate the X-axis and the Y-axis drive means to move said gimballed plateform to cause said collimating means to track said source of light.

B 494,167

LOW SPEED ROTARY MOWER

Robert C. Comer, Hopkins, Minn., assignor to The Toro Company, Minneapolis, Minn.

Filed Aug. 2, 1974, Ser. No. 494,167

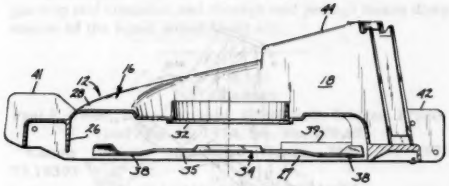
Int. Cl.² A01D *35/262*

U.S. Cl. 56—13.4 **12 Claims**

References Cited

UNITED STATES PATENTS

2,942,396	6/1960	Farnam	56/320.2 X
3,050,924	8/1962	West	56/295
3,220,170	11/1965	Smith et al.	56/295 X
3,568,421	3/1971	Smith et al.	56/320.2 X
3,601,960	8/1971	Buechler	56/320.2



1. Rotary mowing and bagging apparatus, comprising, in combination:

a. a cutting blade mounted for rotation about a substantially vertical axis, said blade having a pair of cutting tips at opposite ends thereof, with each tip including a leading cutting edge and a trailing sail portion having a front surface thereon, each of said front surfaces being inwardly raked at an angle in the range of 25° to 60° with respect to a line parallel to a radial line from said axis of blade rotation, said front surfaces each having an upward rake angle in the range of 18° to 35°, said upward rake angle being defined as the angle between said front surface and a line perpendicular to a cutting plane defined by rotation of said cutting edges about said axis;

b. a mower housing in which said blade is mounted, having an expansion portion with an expansion top wall with a substantial rise therein leading to a discharge opening, said housing also having a continuous exterior side wall surrounding said blade at the height thereof and extending above said sail portions;

c. means for rotatably driving said blade at a tip speed in the range of 5,000 FPM – 14,000 FPM;

d. front and rear wheels mounted on said housing to enable movement of said mower over a ground surface at a controlled height thereabove; and

e. a grass-catching bag attached to said housing at said discharge opening.

B 503,456

TOWING ETC. CABLE PROTECTION MEANS

Wilfred Johnson Cave, and Edward George Culver, both of Sheffield, England, assignors to Hallam Polymers & Engineering Ltd., United Kingdom

Filed Sept. 5, 1974, Ser. No. 503,456

Claims priority, application United Kingdom, Sept. 19, 1973, 43882/73

Int. Cl.² B63B *21/00*

U.S. Cl. 114—230 **9 Claims**

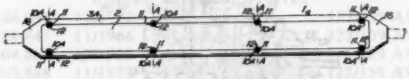
References Cited

UNITED STATES PATENTS

1,640,183	8/1927	Denis	24/135 R UX
2,070,550	2/1937	Anthony	24/135 R
2,561,487	7/1951	Bailhe	114/230
3,718,945	3/1973	Treglode	294/74 X

FOREIGN PATENTS OR APPLICATIONS

1,111,949	3/1956	France	294/74
405,835	7/1966	Switzerland	294/74



1. Means for protecting a towing or mooring cable comprising an elongated sleeve of resilient wear-resistant material with at least one longitudinally extending external flat face, said sleeve being split longitudinally into individual unitary sleeve parts which define a cable receiving longitudinal guideway therebetween the exposed surface of which is comprised of said resilient wear-resistant material, said sleeve parts including a metal strap bonded and imbedded within each of said sleeve parts behind said exposed surface of said guideway so as to remain out of contact with a cable placed through said guideway, said metal straps being positioned adjacent each end of said elongated sleeve, holes extending through each end of the metal straps, holes extending through said sleeve parts which are coaxial with the holes in said straps, and screw means extending through each coaxial pair of holes to secure said sleeve parts together.

B 513,134

PROTECTION CASE FOR TAPE-RECORDER OR RADIO-SET

Kozo Yamamoto, Hirakata, and Takuro Ibi, Kashiwazaki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 8, 1974, Ser. No. 513,134

Claims priority, application Japan, Oct. 12, 1973, 48-119303[U]; Oct. 12, 1973, 48-119304[U]; Oct. 12, 1973, 48-119305[U]; Oct. 15, 1973, 48-119986[U]; Oct. 15, 1973, 48-119987[U]

Int. Cl.² B65D *65/06*

U.S. Cl. 150—52 R **1 Claim**

References Cited

UNITED STATES PATENTS

2,467,471	4/1949	Goldstein	150/52 R
3,280,870	10/1966	Bundy	150/52 R
3,459,870	8/1969	Plummer	150/52 R
3,589,971	6/1971	Reed	150/52 R
3,612,233	10/1971	Nagpal	150/.5

FOREIGN PATENTS OR APPLICATIONS

377,714	6/1964	Switzerland	150/52 R

1. A protection case for an audio instrument and operational controls, having speakers, said case being formed of waterproof sheet material in a shape roughly conforming to the shape of said instrument, said case having a first opening through which said instrument can be inserted and taken out, with plastic engaging portions on opposing surfaces adjacent

said first opening to form a zipper for closing said opening in air and water tight relation with said instrument therein, said case further having a region of reduced thickness on the inner surface thereof so as to form an air space between said speaker and said case, said case further having a plurality of flexible bellows adjacent said control for operating said controls by manually flexing said bellows, said case further having

transparent and opaque portions with the transparent portions being located so as to permit viewing from outside of the operation of said instrument, and said case having a further opening for inserting a cassette into said case with engaging portions of opposing surfaces adjacent said further opening to form a zipper for closing said further opening in air and water tight relation with said instrument therein.

B 527,333

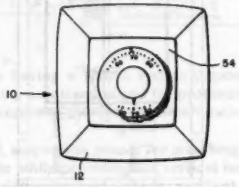
WALL THERMOSTAT CONVERSION KIT ASSEMBLY

Norman S. Stephens, 310 E. Francis, Corona, Calif. 91720

Filed Nov. 26, 1974, Ser. No. 527,333
Int. Cl.² G12B 9/00
U.S. Cl. 248—309 R **3 Claims**

References Cited
UNITED STATES PATENTS

1,716,940	6/1929	Woller	248/300
1,961,728	6/1934	Arnest et al.	248/300 UX
2,731,228	1/1956	Baldwin et al.	248/309 X
3,126,239	3/1964	Winter et al.	248/205 R
3,210,860	10/1965	Lieberman et al.	248/27 X
3,243,553	3/1966	Doyle	337/102 X
3,249,721	5/1966	Baak	337/112 X
3,356,840	12/1967	Cohen	248/223 X



1. In a thermostat wall mounting assembly adapted to have mounted thereon a selected one of two different sizes of thermostats, the combination comprising

a wall mounting bracket including a raised central portion with an opening defined therein and flange means connected to opposite ends of the raised central portion to secure it to a wall, and

a wall plate secured to said wall mounting bracket and including a flange portion extending around the periphery of said wall plate, a first raised boss centrally disposed in said wall plate, and a second raised boss centrally disposed in the first raised boss and having an opening defined therethrough and aligned with the opening in said wall mounting bracket, such that said wall plate can receive a selected one of the two different size thermostats on a selected one of said first and second raised bosses.

B 532,976

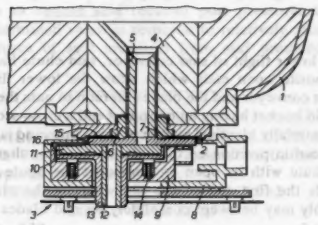
SLIDING GATE VALVES

Ludwig Walther, Dueren-Niederau, Germany, assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 16, 1974, Ser. No. 532,976
Claims priority, application Germany, Dec. 21, 1973, 2363824; Dec. 21, 1973, 7345365
Int. Cl.² B22D 37/00, 41/08
U.S. Cl. 222—512 **14 Claims**

References Cited
UNITED STATES PATENTS

3,709,411	1/1973	Shapland	222/512
3,730,401	5/1973	Bode, Jr.	222/512
3,764,042	10/1973	Shapland et al.	222/512 X
3,866,806	2/1975	Shapland, Jr.	222/504



1. In a sliding gate valve for a bottom pour vessel, wherein the valve comprises a replaceable ceramic head plate adapted for rigid, sealed mounting on the vessel, a slideable carriage and a replaceable ceramic slide plate borne thereon and carrying a pouring bushing, whereby said slide plate is movable in contact with said head plate to bring the bushing into and out of registry with the head plate aperture to open and close the valve, the improvement comprising:

first and second frames in which said head plate and said slide plate are respectively mounted,

cooperating sealing means on said bushing and said slide plate,

a collar having an extended top flange and forming a holder for said bushing, said top flange abutting the slide plate, and spring elements carried by said carriage to engage said top flange and urge same against said slide plate.

B 536,403

PUBLIC WORKS MACHINE EQUIPPED WITH A BUCKET UNLOADING DEVICE

Didier Albert Wolf, Meaux, France, assignor to Societe Anonyme — Poclain, Le Plessis-Belleville, France

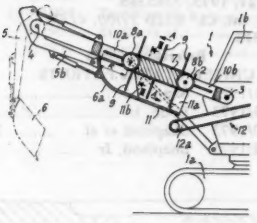
Filed Dec. 26, 1974, Ser. No. 536,403
Claims priority, application France, Jan. 22, 1974, 74.2129
Int. Cl.² B65G 47/00
U.S. Cl. 214—90 R **3 Claims**

References Cited
UNITED STATES PATENTS

2,384,242	9/1945	Fitch	214/90 R

1. A public works machine including a bucket unloading device, and comprising, in combination, a support structure, a jib having first and second opposite ends and articulted on said structure at said first end, a balance beam articulated on said second end of said jib, said balance beam having a free end, a backhoe bucket pivotally mounted on the free end of said balance beam, an endless conveyor movably mounted on said jib and extending along a part of its length adjacent the

first end of the jib, said endless conveyor having upper and lower flights which, during movement of the conveyor, respectively move along the jib in the direction towards the second end of the jib for said upper flight and in the reverse direction for said lower flight, said endless conveyor including transverse blades extending generally perpendicularly therefrom and being distributed regularly over the whole of its length, said jib including a chute mounted thereon enclosing a portion



of the lower flight of said conveyor, said chute having a pair of opposite open ends which allow the lower flight of the endless conveyor and the blades thereon to pass therethrough, and said bucket having an open end and a cross-section which is substantially identical to that of said chute and is adapted to be placed in position by the balance beam in alignment with said chute with its open end adjacent the chute and facing towards the first end of the jib, whereby the chute-bucket assembly may be swept completely by said blades.

B 546,097

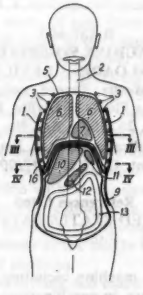
ANTHROPOMORPHOLOGICAL DUMMY FOR STUDYING THE BEHAVIOUR OF THE HUMAN BODY

Boris Gonzalez, Issy les Moulineaux, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Jan. 31, 1975, Ser. No. 546,097
Claims priority, application France, Feb. 8, 1974, 74.04355
Int. Cl.[2] G09B *23/00*
U.S. Cl. 35—17 **9 Claims**

References Cited
UNITED STATES PATENTS

2,288,296	6/1942	Munro	35/17
3,562,925	2/1971	Baermann	35/17
3,792,854	2/1974	Sierra	35/17 X
3,890,723	6/1975	Haurat	35/17



1. A hydro-pneumatic system for a anthropomorphological dummy comprising a thoracic-abdominal cavity confined by an envelope enclosing a rachis, and, in its upper part, a rib assembly connected to the rachis and defining with a sternum, a thoracic cage, said system comprising

a first fluid-tight inflatable pocket disposed in the interior of the said thoracic cage,

an alveolate air permeable material simulating the lungs and enclosed within the first pocket,

a body fixed to the internal wall of said pocket, and simulating the heart,

a second fluid-tight resilient pocket in the interior of the abdominal cavity of the dummy, said second pocket being arranged to be filled with a liquid,

bodies enclosed within the second pocket and simulating respectively the liver, the spleen, and the pancreas, said bodies being fixed to the internal wall of the pocket,

a hollow inflatable ring enclosed within the second pocket, said ring simulating the intestines, and being fixed at a single point to the said second pocket, and

fluid connections leading from the first and second pockets and the ring to the exterior of the dummy whereby fluid can be fed through the connections to the first and second pockets and the ring, each said connection conprising valve means.

B 547,016

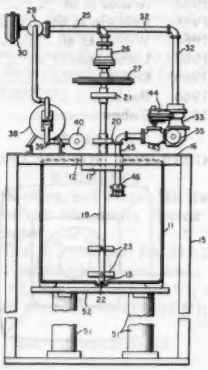
BULK CONTAINER UNLOADING APPARATUS

Joseph A. Richards, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 306,922, Nov. 15, 1972, abandoned. This application Feb. 4, 1975, Ser. No. 547,016
Int. Cl.[2] B01F *7/18*
U.S. Cl. 259—8 **2 Claims**

References Cited
UNITED STATES PATENTS

1,552,905	9/1925	Zimmermann	259/8
2,801,083	7/1957	Balassa	259/8
3,057,519	10/1962	Platt	222/195
3,421,741	1/1969	Baechler	259/108
3,451,724	6/1969	Cappelli	259/95 X



1. Material handling apparatus for unloading liquid-dispersible particulate material comprising

a generally cubical-shaped transportable container having a relatively large centrally located port in the top thereof and a smaller centrally located recess in the bottom thereof,

a frame defining an opening adapted to receive said container,

a hollow mixing shaft supported for rotation about a vertical axis by said frame and extending into said opening, said mixing shaft being open at its lower end and being of a length approximating the container height, said mixing shaft having at least one radially projecting mixing blade affixed thereto, one mixing blade being located near the lower end of said hollow mixing shaft and being affixed to

said hollow mixing shaft so that the edges of said blade remote from said shaft are parallel to said shaft and perpendicular to said container,

drive means for rotating said mixing shaft,

lift support means for supporting the container within said opening and for raising and lowering the container between a lowered position in which the container is disposed with its top below the lower end of the mixing shaft and a raised mixing position wherein the lower end of the mixing shaft is positioned in the container adjacent to said recess,

pump means, and

a conduit connecting said pump means and the upper end of said mixing shaft for introduction of liquid into the container and for withdrawal of a dispersion therefrom.

B 550,810

VEHICLE PROVIDED WITH A FLUIDIC ACCELEROMETER

Dale H. Unruh, and Frederick D. Proksch, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 437,205, Jan. 28, 1974, Pat. No. 3,900,042. This application Feb. 18, 1975, Ser. No. 550,810

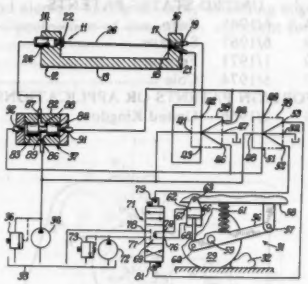
Int. Cl.² B60G *11/56*

U.S. Cl. 280—124 F **1 Claim**

References Cited

UNITED STATES PATENTS

2,992,837	7/1961	Rabow	280/124 F
3,124,368	3/1964	Corley	280/124 F
3,223,103	12/1965	Trinkler	137/83
3,500,846	3/1970	Wood	137/829
3,550,609	12/1970	Roche	137/83



1. In a vehicle having a fluidic system disposed on said vehicle for detecting acceleration and for producing an acceleration signal in response thereto, the combination comprising:

a vehicle wheel, suspension means for attaching said wheel to said vehicle while providing for vertical movement of said wheel relative to said vehicle, resilient means for exerting a force between said vehicle and said suspension means for urging said wheel towards a predetermined vertical position relative to said vehicle, an extensible and contractible fluid cylinder coupled between said vehicle and suspension means,

fluid flow receiver means having a first flow receiver port, and a second flow receiving port with the center of said second flow receiving port being spaced apart from the center of said first flow receiving port in the direction along which acceleration is to be sensed,

fluid jet forming nozzle means having a flow orifice,

means for supplying fluid under pressure to said nozzle means whereby a fluid jet is ejected therefrom,

support means holding said nozzle means in a spaced-apart relationship from said receiver means with said jet being directed towards said receiver ports across an unobstructed gap, whereby deflection of said fluid jet relative to said receiver means in response to acceleration is accompanied by an increase of flow through one of said ports and a decrease of flow through the other thereof,

fluidic signal output means communicated with said receiving ports for generating fluidic signals in response to brief departures of the pressure at said receiving ports from a predetermined value,

a fluid pressure piloted cylinder control valve connected between said cylinder and a source of high pressure fluid and having a normal position at which said cylinder is isolated from said source of high pressure fluid, said control valve having a first pilot means for responding to a relative increase of fluid pressure at said first receiving port by supplying high pressure fluid to said cylinder to raise said wheel relative to said vehicle and having second pilot means responsive to a relative increase of fluid pressure at said second receiving port by supplying high pressure fluid to said cylinder to lower said wheel relative to said vehicle, and

compensating means for varying the flow passage to said jet nozzle to restore said receiver port pressures to said predetermined value in response to relatively prolonged departures of said pressures from said predetermined value.

B 563,932

PLATE MILL FINISHING STAND ROLL LATCH RING

McKinley B. Thomas, Orem, Utah, assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 31, 1975, Ser. No. 563,932

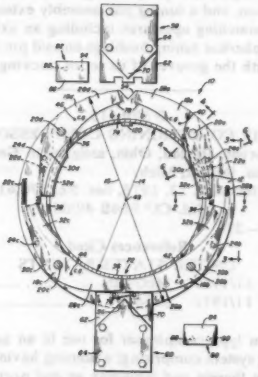
Int. Cl.² B21B *31/08*

U.S. Cl. 72—238 **9 Claims**

References Cited

UNITED STATES PATENTS

2,774,263	12/1956	Leufren	72/238
2,927,488	3/1960	Petereit	72/238
3,508,426	4/1970	Maltby	72/238



1. A latch ring chock retainer assembly for a roll having a circumferal groove formed therein, said latch ring assembly comprising:

a housing including means defining an aperture formed through the center thereof, said aperture having a diameter such that said housing is capable of fitting over an end of such roll;

a plurality of latching arms mounted to said housing, said latching arms being movable between a latched position, in which a portion of said latching arm engages such circumferal groove in such roll, and an unlatched position

in which said portion of said latching arm is moved out of engagement with such roll groove; and

means for biasing said latching arms toward their said latched positions.

B 567,158

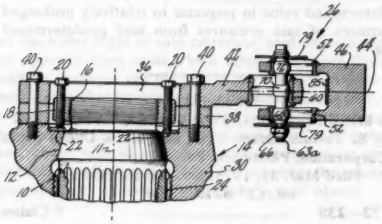
SPHERICAL BIFILAR TUNING PIN BUSHING

Larry B. Eastman, Milford, and Irwin J. Kenigsberg, Trumbull, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 11, 1975, Ser. No. 567,158
Int. Cl.² B64C *27/32*
U.S. Cl. 416—145 **13 Claims**

References Cited
UNITED STATES PATENTS

3,372,758	3/1968	Jenney	416/500 X
3,540,809	11/1970	Paul et al.	416/500 X
3,874,818	4/1975	Saunders et al.	416/144
3,887,296	6/1975	Mills et al.	416/145



1. A bifilar absorber for helicopter rotors including a pendulous element, an absorber support member carried by the rotor, said element and said member having sets of matching large-diameter tracking apertures, tracking inserts in said apertures having shallow peripheral grooves which are arcuate in cross section, and a tuning pin assembly extended through each set of matching apertures including an axial pin and a plurality of spherical tuning bushings on said pin in position to cooperate with the grooves of its set of tracking inserts.

B 570,615

AIR CONDITIONING COMPRESSOR

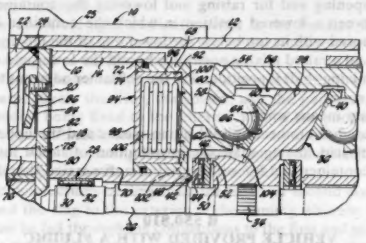
James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 23, 1975, Ser. No. 570,615
Int. Cl.² F04B *49/08*
U.S. Cl. 417—274 **2 Claims**

References Cited
UNITED STATES PATENTS

2,912,833	11/1959	McGrath	417/274 X
3,618,475	11/1971	Sauder	417/274 X

1. A piston type compressor for use in an automotive air conditioning system comprising: a housing having at least one cylinder bore therein and including an end portion overlying the cylinder bore; a first piston supported for reciprocal movement within said cylinder bore and forming in conjunction with said cylinder bore and said end portion a variable volume compression chamber for compressing refrigerant therein; said housing defining a valved inlet to said compression chamber and a valved outlet therefrom to control the flow of refrigerant into and from the compression chamber during an intake stroke and a compression stroke respectively; said first piston having a recess formed therein adjacent said compression chamber; a second piston supported for reciprocal movement in said recess and movable with respect to said first piston so as to extend into said compression chamber and to displace refrigerant therefrom; an axially extendible and contractible bellows located between said pistons and forming a sealed enclosure filled with a compressible fluid whereby movement of said bellows controls the extension and contraction of said second piston and exerts a force on said second position tending to cause it to extend into said compression chamber when the pressure force acting on said second piston from refrigerant within said compression chamber is less than the internal force on said bellows exerted by said fluid.



B 573,994

FRICTION MEASURING APPARATUS

William Dein Lewis, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Co., Wilmington, Del.

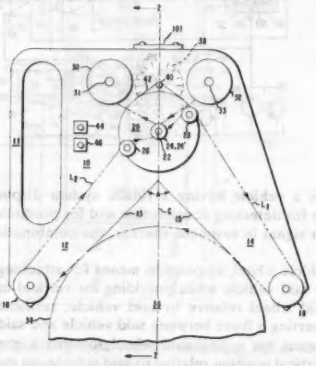
Filed May 2, 1975, Ser. No. 573,994
Int. Cl.² G01N *19/02*
U.S. Cl. 73—9 **5 Claims**

References Cited
UNITED STATES PATENTS

2,378,614	6/1945	Zahn	73/9
3,324,719	6/1967	Segrave	73/160
3,556,369	1/1971	Ferguson	226/25
3,813,917	6/1974	Cole	73/9

FOREIGN PATENTS OR APPLICATIONS

842,919	7/1966	United Kingdom	73/9



1. An apparatus for measuring friction between a yarn and a cylindrical surface comprising:

a frame having two arms extending outwardly at a fixed included angle from a common central location on a line bisecting the angle, said arms each having an inner surface for resting on said cylindrical surface;

a pulley rotatably mounted at the end of each of said arms, each pulley having a peripheral surface tangent to said inner surface of its associated arm;

a disc rotatably mounted at its center on a fixed pivot on said frame at a location above said arms on said line

bisecting said angle, said disc having at least one yarn pulley rotatably mounted thereon at said pivot and two other yarn pulleys mounted rotatably thereon near the periphery of said disc, said two other yarn pulleys being separated by substantially one-half the circumference of said disc;

two driven yarn supply reels mounted on said frame above said fixed pivot on opposite sides of said line bisecting said angle;

means for driving said reels; and

means for sensing the angular position of said disc with respect to said frame when yarn is passed across said cylindrical surface in a prescribed path around said pulleys from one supply reel to the other.

B 589,687

DOOR HANDLE OF A HOUSEHOLD REFRIGERATOR

Edward H. Roberts, Jeffersontown, and Gordon V. Carter, Louisville, both of Ky., assignors to General Electric Company, Louisville, Ky.

Filed June 24, 1975, Ser. No. 589,687

Int. Cl.[2] A47B 95/02

U.S. Cl. 16—125 10 Claims

References Cited

UNITED STATES PATENTS

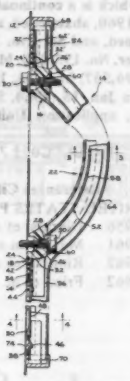
2,186,683	1/1940	Raymond	16/125
2,608,712	9/1952	Seyforth	16/125
3,766,598	10/1973	Roberts	16/125

1. A door handle of a household refrigerator, comprising:

a first element having a first opening and a boss, said boss having an opening and an edge overlying a portion of the first opening;

a second element having inwardly extending edge portions and a protrustion of dimensions sufficient for insertion into the first opening for connecting the first and second elements;

a third element having a nut alignable with the boss opening and being of dimensions sufficient for extending over the



second element protrusion and nesting in the first element; and

a cover extending over said elements and having locking tabs matable with the second element edge portions for connecting the cover to the second element.

CHEMICAL APPLICATIONS

B 337,823

SYNTHESIS OF GON-4-ENES

Gordon Allan Hughes, and Herchel Smith, both of Wayne, Pa., assignors to Herchel Smith, Bryn Mawr, Pa.

Continuation-in-part of Ser. No. 228,384, Oct. 4, 1962, Pat. No. 3,850,911, which is a continuation-in-part of Ser. Nos. 57,904, Sept. 23, 1960, abandoned, and Ser. No. 91,341, Feb. 24, 1961, abandoned, and Ser. No. 137,535, Sept. 12, 1961, abandoned, and Ser. No. 195,000, May 15, 1962, abandoned, and Ser. No. 196,557, May 16, 1962, abandoned. This application Jan. 15, 1964, Ser. No. 337,823

Claims priority, application United Kingdom, Sept. 25, 1959, 32619/59

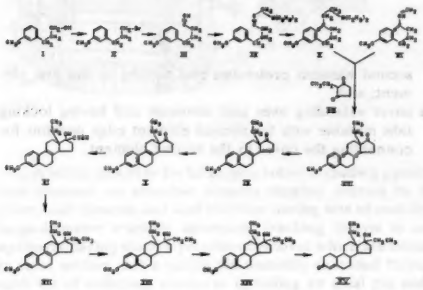
Int. Cl.² C07J *71/00*

U.S. Cl. 424—243 **5 Claims**

References Cited

UNITED STATES PATENTS

2,744,122	5/1956	Djerassi et al.	260/397.4
2,991,295	7/1961	Magerlein et al.	260/397.5
3,032,552	2/1962	Ringold et al.	260/239.55
3,046,273	7/1962	Fried et al.	260/239.55



1. A therapeutic composition having progestational activity comprising as active ingredient a 17-aliphatic carboxylic acid ester of 17α-ethynyl-18-methyl-19-nortestosterone and a pharmaceutical carrier for said compound.

B 591,141

MONOAZO DYESTUFFS CONTAINING AN N-β-1,2,3-TRIAZOLYLETHYL ANILINO COUPLING COMPONENT

Gerhard Wolfrum, Opladen, and Heinrich Gold, Cologne-Stammheim, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

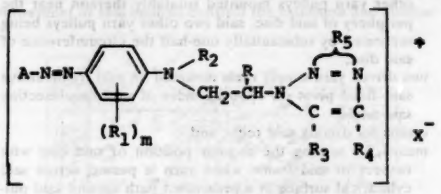
Filed Nov. 1, 1966, Ser. No. 591,141

Claims priority, application Germany, Nov. 8, 1965, 47628

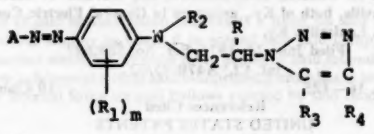
Int. Cl. C09b *29/36*; D06p *1/08*

U.S. Cl. 260—157 **11 Claims**

1. An azo dyestuff selected from the group consisting of



and



wherein R stands for hydrogen or methyl; R_1 is a member selected from the group consisting of chloro, bromo, lower alkyl, trifluoro lower alkyl, lower alkoxy, and acetylamino; *m* is an integer from 0 to 2; R_2 stands for hydrogen, lower alkyl, or substituted lower alkyl, wherein the substituents are selected from the group consisting of cyano and ethoxy carbonyl; R_3 and R_4 are independently selected from the group consisting of hydrogen, lower alkyl, lower alkoxy methyl, phenyl, chlorophenyl, bromophenyl, lower alkyl phenyl, carboxylic acid, carbolower alkoxy; R_5 is selected from the group consisting of lower alkyl and benzyl; A is selected from the group consisting of phenyl, substituted phenyl, thiazol (1,3)-2-yl, 5-nitro thiazol (1,3)-2-yl, benzothiazol (1,3)-2-yl, 6-chloro benzothiazol (1,3)-2-yl, 6-ethoxy benzothiazol (1,3)-2-yl, 3-phenyl-thiadiazole (1,2,4)-5-yl, pyridin-3-yl, quinolin-8-yl, indazol-3-yl, and triazol (1,2,4)-3-yl, wherein the substituents on said phenyl radical are members of the group consisting of halogen, lower alkyl, lower alkoxy, nitro, cyano, carboxy, trifluoromethyl, carboxy lower alkyl, sulphoxy lower alkyl, carbonamide, lower alkyl carbonamide, dilower alkyl carbonamide, sulfonamide, lower alkyl sulfonamide, and dilower alkyl sulfonamide; X stands for an anion; and wherein the alkyl groups contain from 1–4 carbon atoms; said dyestuff being free of sulphonic acid groups.

B 750,679

THERMAL SHOCK RESISTANT CERAMIC COMPOSITE

Ronald C. Rossi, and Robert D. Carnahan, both of Torrance, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 6, 1968, Ser. No. 750,679

Int. Cl.² C04B *35/04*

U.S. Cl. 106—58 **3 Claims**

References Cited

UNITED STATES PATENTS

3,137,657	6/1964	Quirk et al.	252/478
3,261,800	7/1966	Collins	252/478 X

3,263,004	7/1966	Bean	252/301.1 X
3,278,454	10/1966	Turner et al.	252/478
3,320,176	5/1967	Davis	252/301.1

OTHER PUBLICATIONS

Nuclear Science Abstracts; Vol. 21, No. 6, Mar. 1967; Abstract No. 9244; p. 968.

1. A hot-pressed ceramic oxide composite possessing a high degree of resistance to failure from thermal fracture, said composite consisting essentially of a blend composed of about 5 to 30 percent by volume of boron nitride flakes uniformly dispersed in a powdered refractory oxide matrix.

B 105,006

METHOD OF MAKING AN EPITAXIAL GROWTH LAYER OF $GaAs_{1-x}P_x$ COMPOUND SEMICONDUCTOR

Masahiko Ogirima, Shinjyuku; Toshimitu Shinoda, Hamura; Yuichi Ono, Kokubunji, and Hajime Kusumoto, Tama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 8, 1971, Ser. No. 105,006

Claims priority, application Japan, Jan. 9, 1970, 45-2487; Jan. 9, 1970, 45-2488

Int. Cl.² H01L *21/205, 21/18*

U.S. Cl. 148—175 **18 Claims**

References Cited

UNITED STATES PATENTS

3,146,137	8/1964	Williams	148/175
3,218,205	11/1965	Ruehrwein	148/175
3,312,570	4/1967	Ruehrwein	148/175
3,322,575	5/1967	Ruehrwein	148/175 X
3,421,952	1/1969	Conrad et al.	148/175
3,441,000	4/1969	Burd et al.	148/175 X
3,462,323	8/1969	Groves	148/175
3,471,324	10/1969	Wilson et al.	117/106 A X

OTHER PUBLICATIONS

Weinstein, et al., "Prep. and Properties of GaAs–GaP—heterojunctions", ibid., Vol. 111, No. 6, June 1964, pp. 674–682.

Tietjen et al., "All-in-one Process for Building Junctions", Electronics, Nov. 13, 1967, pp. 113–115.

Shaw et al., "Gallium Arsenide Epitaxial Technology", 1966, Symposium on GaAs, Reading, Sept. 1966, pp. 10–15.

Eddolls et al., "Prep. and Properties of Epitaxial Gallium Arsenide", Ibid., pp. 3–9.

Finch et al., "Preparation of $GaAs_xP_{1-x}$ by Vapor Phase Reaction", J. Electrochem. Soc., Vol. 111, No. 7, July 1964, pp. 814–817.

Ing et al., "Open Tube Epitaxial Synthesis of GaAs and GaP", Ibod., Vol. 109, No. 10, Oct., 1962, pp. 995–997.

Effer, D., "Epitaxial Growth of Doped and Pure GaAs—System", Ibid., Vol. 112, No. 10, Oct. 1965, pp. 1020–1025.

Tietjen et al., "Prep. and Properties of Vapor–Deposited—Phosphine", Ibid., V. 113, No. 7, July 1966, pp. 724–728.

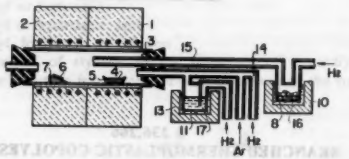
1. A method of making an epitaxial growth layer of $GaAs_{1-x}P_x$ ($0<x<1$) compound semiconductor on a seed material that is crystallographically compatible with the layer, comprising the steps of:

disposing a source material including Ga and said seed material in a reaction tube spaced from each other;

maintaining said source material at a temperature higher than that of said seed material;

heating element As to a temperature so as to obtain a controlled amount of As_4 gas;

heating elemental P to a temperature so as to obtain a controlled amount of P_4 gas;



introducing a gaseous material selected from the group consisting of a mixture of PCl_3, As_4 gas produced from said heated elemental As and H_2 gas, or a mixture of P_4 gas produced from said heated elemental P, $AsCl_3$, and H_2 gas into the reaction tube so as to contact at least said gaseous material with said source material, whereby a reaction gas including GaCl is produced; and

contacting said reaction gas with said seed material.

B 159,570

AMMOXIDATION OF ALKANES

George Augustus Castellion, and William Frank Marzluff, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed July 2, 1971, Ser. No. 159,570

Int. Cl.² C07C *120/14*

U.S. Cl. 260—465.3 **6 Claims**

References Cited

UNITED STATES PATENTS

3,044,966	7/1962	Callahan et al.	260/465.3 UX
3,118,928	1/1964	Garrison, Jr.	260/465.3
3,161,670	12/1964	Adams et al.	260/465.3
3,309,395	3/1967	Nohe et al.	260/465.3
3,365,482	1/1968	Khoobiar	260/465.3
3,433,823	3/1969	McMahon	260/465.3
3,518,295	6/1970	Eden	260/465.3
3,525,101	8/1970	Young et al.	260/465.3
3,532,734	10/1970	Anderson et al.	260/465.3
3,670,009	6/1972	Taylor	260/465.3

1. A catalytic process for making α,β-ethylenically-unsaturated lower aliphatic nitrile, said process comprising contacting a gas mixture comprising reactants ammonia, oxygen and lower alkane hydrocarbon having 3 to 4 carbon atoms, with a solid catalyst consisting essentially of mixed bismuth oxide and molybdenum oxide with at least said mo-

lybdenum oxide present entirely as a non-crystalline solid phase with phosphoric acid present as fluxing agent in said non-crystalline phase at reaction temperature in the range from about 400°C. to about 600°C. and residence time sufficient to effect the catalytic conversion of the lower alkane hydrocarbon to said nitrile.

B 236,266

BRANCHED THERMOPLASTIC COPOLYESTERS

Guenther Kurt Hoeschele, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 20, 1972, Ser. No. 236,266
Int. Cl.[2] C08G *63/20*
U.S. Cl. 260—75 R 16 Claims

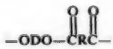
References Cited
UNITED STATES PATENTS

2,895,946	7/1959	Huffman	260/75
3,546,180	12/1970	Caldwell et al.	260/76

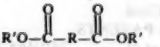
1. In a process for preparing a segmented thermoplastic copolyester, said copolyester consisting essentially of a multiplicity of recurring long chain ester units and short chain ester units joined head-to-tail through ester linkages, said long chain ester units being represented by the formula

I

and said short chain units being represented by the formula

II 

which comprises reacting a dicarboxylic acid having a weight less than about 300; said acid being represented by the formula



wherein R is a divalent radical and R′ is independently selected from the group consisting of hydrogen and C_1–C_{10} alkyl; a poly(alkylene oxide) glycol having a molecular weight of about 400–4,000 and a carbon to oxygen ratio of about 2.0–4.3 said glycol being represented by the formula

HO—G—OH

wherein G is a divalent radical, and a diol having a molecular weight less than about 250 and represented by the formula

HO—D—OH

wherein D is a divalent radical, the improvement which comprises conducting the reaction in the presence of about 0.3 to 1.2 equivalents per 100 moles of said dicarboxylic acid of a branching agent, said branching agent being represented by the formula $(HO)_a X (COOH)_b$ wherein X is a polyfunctional radical, $a = 0$–6, $b = 0$–4 and $a + b = 3$–6, said branching agent having a molecular weight of about 92 to 5,000.

B 326,211

PRODUCTION OF THERMOSET WATER-IN-OIL EMULSIONS

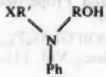
Golden F. Watts, 16201 Gladiola Ave., West, Rosemount, Minn. 55068, and Carlton E. Coats, 2716 Dana Drive, Burnsville, Minn. 55378

Continuation of Ser. No. 135,684, April 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 110,855, Jan. 29, 1971, abandoned. This application Jan. 24, 1973, Ser. No. 326,211
Int. Cl.[2] C08L *67/06*
U.S. Cl. 260—22 CB 24 Claims

References Cited
UNITED STATES PATENTS

3,236,915	2/1966	Zanaboni	260/864
3,256,219	6/1966	Will	260/29.6 NR
3,367,994	2/1968	Parker et al.	260/864
3,442,842	5/1969	von Bonin	260/29.6 NR
3,629,129	12/1971	Bedighian	260/22 CB

1. A method of curing polymerizable water-in-oil emulsions in which at least a major weight portion of the oil phase is one or more α, β-ethylenically unsaturated polyester resin of a member selected from the group consisting of α,β-ethylenically unsaturated polycarboxylic acid, anhydrides thereof, and mixtures thereof; and a member selected from the group consisting of polyhydric alcohol, alkylene oxide, and mixtures thereof; and is susceptible to free radical induced polymerization and copolymerizable ethylenically unsaturated compounds susceptible to free radical induced polymerization wherein said emulsion contains and is polymerized to thermoset form with the aid of at least one peroxy free radical generating catalyst compound, oil soluble cobalt salt of carboxylic acid promotor and at least about four coordination equivalents per mole of cobalt as metal of as least one amine compound promotor having at least one hydroxy alkyl group connected to the amino nitrogen and having the following formula:



wherein X is a hydroxy group, R and R′ are identical or different divalent saturated aliphatic hydrocarbon groups having 1–6 carbon atoms and Ph is phenyl; and the weight of said combination of amine, cobalt salt and peroxy catalyst is equal to about 0.25 to about 10% by weight, based on the polymerizable ingredients of the emulsion.

6. The method of claim 1 wherein said cobalt salt is selected from the group of consisting of cobalt neodecanate, cobalt tallate, cobalt stearate, cobalt octoate, cobalt linoleate, and cobalt naphthenate.

B 333,838

IRON-FORTIFIED SOLUBLE COFFEE AND METHOD FOR PREPARING SAME

Sigmund L. Klug, Monroe; Frederick J. Patrizio, New City, and William J. Einstman, Port Chester, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Feb. 20, 1973, Ser. No. 333,838
Int. Cl.² A23F 1/04
U.S. Cl. 426—594 6 Claims

References Cited
UNITED STATES PATENTS

2,206,319	7/1940	Geitz	426/302
2,357,069	8/1944	Barackman	426/218 X
3,243,347	3/1966	Kracaver	426/311 X
3,432,308	3/1969	Reimus et al.	426/490 X
3,595,351	8/1971	Landenberg et al.	426/271 X
3,597,669	7/1971	Strobel	426/329 X
3,689,641	9/1972	Spangler et al.	426/218 X

OTHER PUBLICATIONS

Coffee Processing Technology, Vol. 2, by Sivetz, published by Avi Pub. Co., Westport Conn., 1963, p. 19.
Abstract 70:86395n, 1969,–Phenolic Substances contained in Coffee Wax.
Sivetz, "Coffee Processing Technology", Vol. 2, p. 240, published by Avi Pub. Co., 1963.
Sivetz and Foote "Coffee Processing Technology", Published by Avi Pub. Co., pp. 232–233, Westport, Conn., 1963, Vol. 1.

1. A method for producing an iron-fortified soluble coffee comprising the steps of:

a. producing a liquid coffee extract from a counter-current, semi-continuous extraction process, said extract having a soluble coffee solids concentration of from about 10 to 30% by weight,

b. cooling said extract as it is leaving the extraction process to between about 35° and 70°F,

c. maintaining said extract at between 35 and 70°F for a period of time sufficient to effect precipitation of polyhydroxyphenols and polyhydroxy-phenol-polysaccharide complexes that are present in the coffee extract, then

d. separating said precipitated material from said extract,

e. adding a source of assimilable, elemental iron to the separated extract of step d at a level of from 0.01 to 1.0% elemental iron by weight of soluble coffee solids, and then

f. drying said iron-fortified extract.

B 354,222

PRODUCTION OF 1-METHYL-3-PHENYLINDANS

Martin Fischer, Ellerstadt; Hans-Juergen Quadbeck-Seeger, Ludwigshafen; Gerhard Kilpper, Mannheim; Hans-Georg Schecker, Ludwigshafen, and Waldemar Koehler, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Apr. 25, 1973, Ser. No. 354,222
Int. Cl.² C07C 3/24
U.S. Cl. 204—162 R 13 Claims

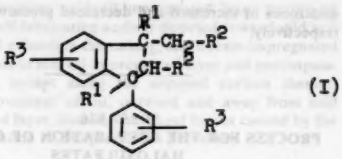
References Cited
UNITED STATES PATENTS

3,483,102	12/1969	Arnold et al.	204/162 R X

FOREIGN PATENTS OR APPLICATIONS

768,410	2/1971	Belgium

1. A process for the production of a 1-methyl-3-phenylindane of the formula (I):



(I)

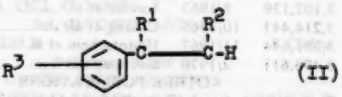
in which

R^1 is alkyl or hydrogen;

R^2 is alkyl or hydrogen; and

R^3 is alkyl, hydrogen or halogen

by dimerization of styrene in the presence of a catalyst wherein the reaction is carried out with a styrene of the formula (II):



(II)

in which R^1, R^2 and R^3 have the above meanings, in the presence or absence of an oxidizing agent and in the presence of an organic compound capable of absorbing light of from 2000 to 8000 A and irradiated with said light.

B 356,470

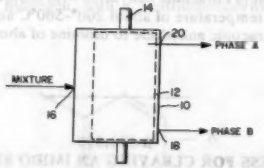
SEPARATION OF LIQUID PHASES

Walter R. Marshall, Bloomfield; Richard A. Gregory, Jr., Belle Mead, and Richard H. Handwerk, South Somerville, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 2, 1973, Ser. No. 356,470
Int. Cl.² B01D 21/26
U.S. Cl. 210—84 4 Claims

References Cited
UNITED STATES PATENTS

2,190,596	2/1940	Dorr	210/49
2,659,761	11/1953	Frevel et al.	210/179 X
3,233,742	2/1966	Shaines et al.	210/83 X
3,288,443	11/1966	Lynch et al.	259/9
3,644,103	2/1972	Yoon et al.	23/270 R
3,687,288	8/1972	Lynch et al.	210/84
3,705,099	12/1972	Hunter	210/322 X
3,718,259	2/1973	Harrison	210/84 X



1. The process for effecting phase separation of relatively high and low viscosity immiscible liquids comprising: providing and maintaining, between inner means in relative rotational movement with outer sleeve means, at least one zone of increased pressure constriction and of decreased pressure constriction; feeding a multi-phase mixture of relatively high viscosity and relatively low viscosity liquids to the interior of said sleeve means between said zones of increased and decreased pressure constriction; and withdrawing said high viscosity liquid and said low viscosity liquid from the vicinities of

said zones of increased and decreased pressure constriction, respectively.

B 357,526

PROCESS FOR THE PREPARATION OF CARBACYL HALOSULFATES

David C. England, and Carl G. Krespan, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 7, 1973, Ser. No. 357,526
Int. Cl.² C07F *143/70*
U.S. Cl. 260—545 R **1 Claim**

References Cited
UNITED STATES PATENTS

2,273,974	2/1942	Meiser	260/507 R
2,628,253	2/1953	Dowdall	260/545 R
3,102,139	8/1963	Lawlar et al.	260/546
3,214,443	10/1965	Chiang et al.	260/327
3,351,644	11/1967	Hauptschein et al.	260/544 F
3,493,611	2/1970	Sweeney	260/544 F

OTHER PUBLICATIONS

Paul et al., "Indian J. Chem.," 10 (1), (Jan. 1972), pp. 92–93.
Paul et al., "Z. Anorg. Allg. Chem.," Band 321, (1963), pp. 62–69.
Belaventseu et al., Zh. Organ. Khim., 9 (2), pp. 256–259, (Feb., 1973).

1. Method of making carbacyl fluorosulfates which comprises contacting and reacting trifluoroacetyl fluoride with sulfur trioxide at −30°C to 100°C.

B 369,373

PROCESS FOR MAKING β-BROMOCITRACONIC ANHYDRIDE

R. Garth Pews, 4403 Andre, and Ralph A. Davis, 1160 Poseyville Road, both of Midland, Mich. 48640

Filed June 12, 1973, Ser. No. 369,373
Int. Cl.² C07D *307/60*
U.S. Cl. 260—346.8 R **9 Claims**

References Cited
OTHER PUBLICATIONS

Beilsteins Handbuch der Organischen Chemie, 4th Ed., Vol. 17, p. 441 (system no. 2476), Verlag von Julius Springer, Berlin Germany, 1933.

1. The process of making β-bromocitraconic anhydride by the reaction of citraconic anhydride with bromine in the vapor phase at a temperature of about 200°–500°C and with a molar ratio of citraconic anhydride to bromine of about 1:1 to about 4:1.

B 371,095

PROCESS FOR CLEAVING AN IMIDO SIDE CHAIN FROM PENICILLINS AND CEPHALOSPORINS

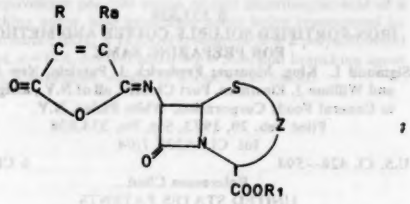
Stjepan P. Kukolja, Indianapolis; and Steven R. Lammert, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed June 18, 1973, Ser. No. 371,095
Int. Cl.² C07D *501/20*
U.S. Cl. 260—239.1 **59 Claims**

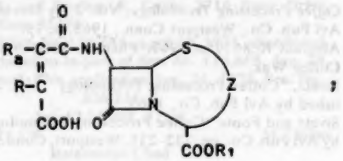
References Cited
UNITED STATES PATENTS

3,487,074	12/1969	Sheehan	260/239.1
3,843,682	10/1974	Kukolja et al.	260/243 C

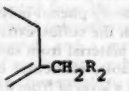
1. A process for preparing an isoimide of the formula



which comprises the step of dehydrating an amic acid of the formula

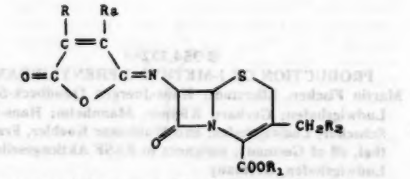


in which, in the above formulae, R and R_a are hydrogen, or R and R_a taken together with the carbon atoms to which they are attached represent an ortho-phenylene ring;

Z is  or ;

R_1 is hydrogen or a carboxy protecting group; and R_2 is hydrogen, acetoxy, methoxy, methylthio, (5-methyl-1,3,4-thiadiazol-2-yl)thio, or (1-methyl-1H-tetrazol-5-yl)thio.

46. A compound of the formula



in which R and R_a are hydrogen, or R and R_a taken together with the carbon atoms to which they are attached represent an orthophenylene ring; R_1 is hydrogen or a carboxy protecting group; and R_2 is hydrogen, acetoxy, methoxy, methylthio, (5-methyl-1,3,4-thiadiazol-2-yl)thio, or (1-methyl-1H-tetrazol-5-yl)thio.

B 371,635
METHOD OF FABRICATING AN ENSULATED GATE FIELD-EFFECT DEVICE

Bernard W. Boland, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 57,401, Sept. 22, 1971, abandoned, which is a division of Ser. No. 740,967, June 28, 1968, abandoned. This application June 20, 1973, Ser. No. 371,635

Int. Cl.² B05D *5/12*

U.S. Cl. 427—93 **5 Claims**

References Cited

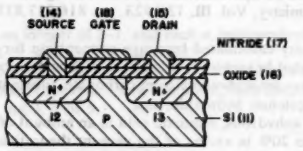
UNITED STATES PATENTS

3,258,359	6/1966	Hugle	117/213
3,331,716	7/1967	Bloem et al.	148/175
3,597,667	8/1971	Horn	317/234

OTHER PUBLICATIONS

Bean et al., Some Properties of Vapor Deposited Silicon Nitride Films using the SiH_4–NH_3–H_2 System. In J. Electrochem. Soc. Solid State Science. 114(7), pp. 733–732.

Handbook of Chemistry & Physics, 48th Ed., Cleveland, Ohio, Chemical Rubber Co., 1967, p. D58.



N-CHANNEL ENHANCEMENT

2. A method for the manufacture of an insulated gate field-effect transistor which includes thermal growth of an oxide layer on a silicon substrate comprising the steps of:

passing a mixture of oxygen and hydrogen, in which the percentage of oxygen in the mixture is maintained within the range of 0.1% up to 4.0% by volume, in contact with the substrate while maintaining the substrate at a temperature between 800°C and 1400°C;

forming a silicon nitride layer by pyrolytic deposition on the oxide layer by passing a mixture of hydrogen, silane and ammonia in contact with the oxide and substrate while maintaining the latter at a temperature between 800°C and 1100°C.

B 380,137
OIL-IMPREGNATED SINTERED PRODUCT AND METHOD OF PRODUCING SAME

Hiroshi Seino, 2300 Hino-cho, Konan, Yokohama; Norio Yamada, Nissan Uragoh-Ryo, No. 3-68-1, Oppama-Higashi-cho, Yokosuka; Shigeo Kimura, 339, Takakura, Fujisawa; Hideaki Kosugi, Nissan Uragon-Ryo, No. 3-68-1, Oppama-Higashicho, and Koreyuki Yamamoto, 2-25 Mabori-cho, both of Yokosuka, all of Japan

Filed July 18, 1973, Ser. No. 380,137

Claims priority, application Japan, July 19, 1972, 47-71573

Int. Cl.³ C10M *5/00;* **F16D** *69/00;* **C10M** *7/00*

U.S. Cl. 252—12.2 **3 Claims**

References Cited

UNITED STATES PATENTS

3,305,325	2/1967	Brasse et al.	252/12.2

FOREIGN PATENTS OR APPLICATIONS

714,946	9/1954	United Kingdom	252/12.2
4,527,210	7/1970	Japan	252/12.2

1. A shaped product of a sintered metal powder subject to rotational movement at relatively high speeds about an axis of rotation extending through the product, comprising an oil-impregnated layer which is circumferentially disposed about said axis of rotation; said oil-impregnated layer having an exposed and self-lubricating surface directed toward said axis of rotation and extending therealong; and a resin-impregnated layer contiguous to said oil-impregnated layer and encompassing the same except along the exposed surface thereof; whereby a movement of oil, outward and away from said oil-impregnated layer, due to centrifugal forces caused by the high speed rotation of the product is prevented.

B 382,120
PREPARATION OF ASYMMETRIC IMINODIBENZYL COMPOUNDS

Ryoichi Kitamura; Eiichi Kitamura; Tetsuo Kitamura, and Tameo Kitamura, all of Suita, Japan, assignors to Eiichi Kitamura; Tetsuo Kitamura and Tameo Kitamura, all of Osaka, Japan

Filed July 24, 1973, Ser. No. 382,120

Claims priority, application Japan, July 24, 1972, 47-74367; July 24, 1972, 47-74368

Int. Cl.² C07D *223/28*

U.S. Cl. 260—239 D **8 Claims**

References Cited

UNITED STATES PATENTS

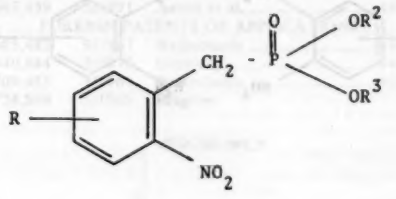
2,764,580	9/1956	Schindler et al.	260/239 D
3,068,222	12/1962	Craig	260/239 D

OTHER PUBLICATIONS

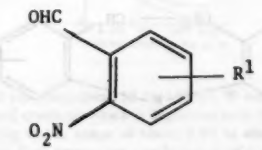
Horner et al., Ber. Deut. Chem., Vol. 91, pp. 61–63, (1958).

Seus et al., J. Org. Chem., Vol. 26, p. 5243 (1961).

1. A process for preparing asymmetric iminodibenzyl derivatives, which comprises condensing a 2-nitrobenzyl phosphonic ester of the formula:

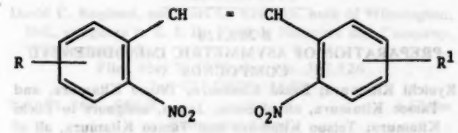


wherein R is one or more substituents selected from the group consisting of hydrogen, halogen, amino, sulfamoyl, lower alkyl, lower alkoxy and lower alkanoyl, and R^2 and R^3 are each hydrogen, lower alkyl, phenyl or phenyl (lower) alkyl, provided that when one of R^2 and R^3 is hydrogen, the other is different from hydrogen, with a 2-nitrobenzaldehyde of the formula:

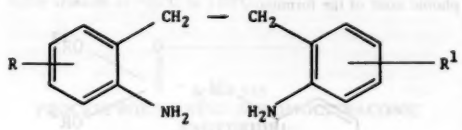


wherein R^1 is one or more substituents selected from the group consisting of hydrogen, halogen, amino, sulfamoyl, lower alkyl, lower alkoxy and lower alkanoyl, R and R^1 being asymmetrically attached to the respective positions of the benzene rings when R and R^1 are the same or different or being different when R and R^1 are attached to the same positions on the respective benzene rings, in an inert organic solvent in the presence of a condensing agent selected from the group consisting of an alkali metal alcoholate, sodium

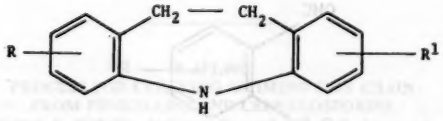
hydride and sodium amide, reducing the resultant 2,2'-dinitrostilbene of the formula:



wherein R and R^1 are each the same as defined above, by catalytic hydrogenation or in the presence of a reducing agent, and ringclosing the resultant 2,2'-diaminodibenzyl of the formula:



wherein R and R^1 are each the same as defined above, by heating in the presence or absence of a catalyst, to give an iminodibenzyl of the formula:



wherein R and R^1 are each the same as defined above.

B 389,605

DRY CARBONATED BEVERAGE CONCENTRATE EMPLOYING AMORPHOUS CALCIUM CARBONATE

Howard D. Stahl, Hartsdale, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Aug. 20, 1973, Ser. No. 389,605
Int. Cl.² A23L 2/00
U.S. Cl. 426—561 **4 Claims**

References Cited
UNITED STATES PATENTS

601,007	3/1898	Sturcke	423/165
603,225	4/1898	Sturcke	423/165
603,226	4/1898	Sturcke	423/165
1,552,024	9/1925	Altow	423/432
2,433,123	12/1947	Hudson	426/225
2,851,360	9/1958	Diller	426/191 X
2,984,543	5/1961	Smith et al.	426/225 X
3,667,962	6/1972	Fritzberg et al.	426/191

OTHER PUBLICATIONS

Gillott, "Carbonation of $Ca(OH)_2$ Investigated by Thermal and X-Ray Diffraction Methods", J. Appl. Chem. 1967, Vol. 17, July, pp. 185–189.

Mellor, A Comprehensive Treatise on Inorganic and Theoretical Chemistry, Vol. III, 12/1923, pp. 816,817,818.

1. A dry carbonated beverage concentrate for preparing a carbonated beverage by admixture with water comprising:
   a. X-ray amorphous calcium carbonate, substantially devoid of calcium hydroxide, and
   b. an anhydrous, nontoxic acid in an amount of from about 1 to 20% in excess of the amount theoretically required to completely evolve the carbon dioxide from the amorphous calcium carbonate and any supplemental carbonation source present in the beverage.

B 390,979

NOVEL IRON OXIDE CATALYSTS

Robert H. Callighan, Verona, and John O. Hawthorne, Penn Hills Township, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 186,557, Oct. 4, 1971, abandoned. This application Aug. 23, 1973, Ser. No. 390,979
Int. Cl.² B01J 29/06
U.S. Cl. 252—455 R **6 Claims**

References Cited
UNITED STATES PATENTS

2,250,421	7/1941	Riblett	252/472 X
2,661,338	12/1953	Lanning	423/633 X
3,361,531	1/1968	Erb et al.	423/633 X
3,414,378	12/1968	Stedman	252/472 X
3,547,582	12/1970	Arakawa	423/633 X

OTHER PUBLICATIONS

"Chemical Abstracts", 46, 1952, p. 10994h.
"Chemical Abstracts", 67, 1967, p. 45635k.

1. A process for preparing an iron oxide catalyst comprising:
   a. adding iron carbonyl to an inert carrier gas,
   b. flowing the carbonyl containing carrier gas over a suitable support to deposit the carbonyl onto the support at a rate such that the temperature remains in the range of about 0° – 100°C for a period of time sufficient to saturate the support, and
   c. flowing an oxidizing gas over the support while maintaining the temperature below 100°C to oxidize the adsorbed carbonyl to iron oxide.

B 403,326

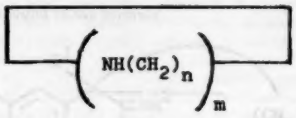
MACROCYCLIC POLYAMINES

Jack E. Richman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 3, 1973, Ser. No. 403,326
Int. Cl.² C07D 259/00
U.S. Cl. 260—239 BC 7 Claims

References Cited
UNITED STATES PATENTS
1,951,992 3/1934 Perkins ..... 260/239 BC X
OTHER PUBLICATIONS
Chemical Substance Index, *Chemical Abstract*, Vol. 76, p. 1687CS, (1972).

1. A compound having the formula



where *m* is an integer of 3–7, and each *n*, independently, is an integer of 2–5, with the provisos that
when *m* is 3 and two of the *n* values are 2 or 3, then the third *n* is 4 or 5, and when *m* is 4 and one *n* is 2, then the remaining values of n are 3, 4 or 5.

B 403,883

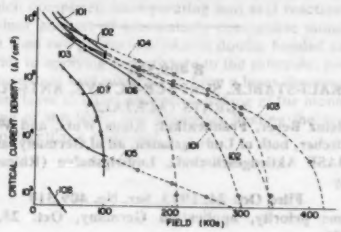
SUPERCONDUCTIVE ELEMENTS AND METHOD FOR PRODUCING THE SAME

Yoshinobu Tarutani, Kokubunji; Ushio Kawabe; Mitsuhiro Kudo, both of Hamura, and Sadanori Taguchi, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 5, 1973, Ser. No. 403,883
Claims priority, application Japan, Oct. 6, 1972, 47-99801; Jan. 10, 1973, 48-5217
Int. Cl.² B05D 5/12; B32B 15/04; C23C 13/02
U.S. Cl. 428—469 19 Claims

References Cited
UNITED STATES PATENTS
3,328,200 6/1967 Neugebauer 117/93.3
3,472,694 10/1969 Hanak 117/227
3,552,352 1/1971 McConnell 117/93.3
3,620,833 11/1971 Gleim et al. 117/212
FOREIGN PATENTS OR APPLICATIONS
1,106,797 3/1968 United Kingdom 29/599
OTHER PUBLICATIONS
Foner et al., *Properties of Superconducting Nb_3Ga Materials*, In *Applied Superconductivity Conference*, May 1972, pp. 404–406.
Hammond et al., *Superconducting Properties of $Nb_3(Al,Ge)$ Prepared by Vacuum Vapor Deposition of the Elements*. In *J. Appl. Phys.*, Vol. 43, No. 5, (May 1972), pp. 2407–2413.
Amatuni, et al., *Linear Thermal Expansion of Quartz & Aluminum Oxide Crystals*, In *General Physical Chemistry, Vol. 66, 1957, p. 5577, Article 59119m*.

1. A superconductive element comprising a substrate, at least one face portion of which is composed of alumina, and a layer of a superconductive material formed to cover said face portion composed of alumina, said superconductive material consisting essentially of an intermetallic compound selected from the group consisting of a compound represented by the formula $Nb_j(Al_{1-x}Ge_x)$ in which the value of *j* is within a range of from 2.3 to 4.0 and the value of *x* is within a range of from 0 to 0.5, and a compound represented by the formula $Nb_k(Ga_{1-z}Al_z)$ in which the value of *k* is within a range of



from 2.3 to 4.9 and the value of *x* is within a range of from 0 to 0.5.

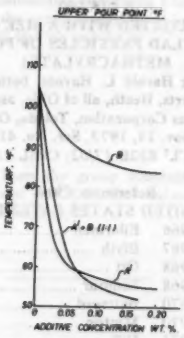
B 407,812

FLOW IMPROVERS

Roger Charles Price, 3, Elm Road, Charlton Heights, Wantage, Berkshire, England

Continuation of Ser. No. 35,320, May 7, 1970, abandoned.
This application Oct. 18, 1973, Ser. No. 407,812
Claims priority, application United Kingdom, May 9, 1969, 23776/69
Int. Cl. C10l 1/16
U.S. Cl. 44—62 1 Claim

References Cited
UNITED STATES PATENTS
3,567,639 3/1971 Aaron et al. 44/62
FOREIGN PATENTS OR APPLICATIONS
6,603,483 9/1967 Netherlands 44/62
1,940,944 3/1970 Germany 44/62
6,709,453 1/1969 Netherlands 44/62
724,569 5/1969 Belgium



1. A fuel oil comprising 35 to 100 wt. % residue from the distillation of crude oil which is improved in its flow properties by containing in the range of about 0.01 to about 1 wt. % of a synergistic flow improving combination of a polymer blend comprising: a first polymer which is an oil soluble flow improving copolymer of ethylene and vinyl acetate having a molecular weight in a range of about 1000 to about 60,000 and containing about 86 to 97 mol % of ethylene; in combination with a second oil soluble flow improving polymer which is acyl polystyrene having a number average molecular weight in the range of 1000 to 25,000 and wherein at least half of said styrene units are acylated with C_{22}–C_{30} straight chain acyl groups; and wherein the weight ratio of said second polymer to said first polymer is in the range of about 5:1 to 1:5, said

synergistic combination in said oil giving a pour point improvement greater than a like amount of either said first or second polymer alone.

B 409,310

ALKALI-STABLE, SURFACE-ACTIVE, ANTI-FOAM AGENTS (ACETALS)

Karl-Heinz Beyer, Frankenthal; Klaus Wulz, and Wolfgang Kindscher, both of Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Oct. 24, 1973, Ser. No. 409,310

Claims priority, application Germany, Oct. 25, 1972, 2252186

Int. Cl.² C07C *43/30*

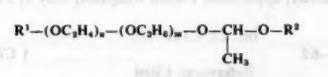
U.S. Cl. 260—615 A **2 Claims**

References Cited

UNITED STATES PATENTS

2,905,720	9/1959	Benneville et al.	260/609
2,905,721	9/1959	Benneville et al.	260/613 B
3,036,130	5/1962	Jackson et al.	260/613 B
3,244,753	4/1966	Leary	260/613 B

1. A compound of the formula:



(I)

where R^1 is alkyl of 7 to 22 carbon atoms; R^2 is alkyl of 1 to 10 carbon atoms; n is one of the integers from 1 to 30; and m is one of the integers from 5 to 50; with the proviso that the ratio of m:n is at least 1:1.

B 415,590

GLASS FIBER COATED WITH A SIZE COMPRISING EMULSIFIED CLAD PARTICLES OF POLY(METHYL METHACRYLATE)

Kenneth P. Chase; Harold L. Haynes, both of Newark, and Michael G. Roberts, Heath, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 14, 1973, Ser. No. 415,590

Int. Cl.² B32B *17/02*; C08L *23/02*

U.S. Cl. 428—378 **18 Claims**

References Cited

UNITED STATES PATENTS

3,284,179	11/1966	Eilerman	65/3
3,329,638	4/1967	Blyth	260/885
3,374,289	3/1968	Ott	260/29.6 RB
3,399,159	8/1968	Samour	260/29.6 RB
3,489,699	1/1970	Battaerd	260/885
3,502,745	3/1970	Minton	260/29.6 RB
3,599,418	8/1971	Hill	117/126 GR
3,615,311	10/1971	Ignatius	65/3
3,632,535	1/1972	Gravera	260/29.6 RB
3,655,353	4/1972	Nalley	117/126 GB
3,657,172	4/1972	Gallagher	260/29.6 RB
3,661,994	5/1972	Hwa	260/29.7 OP
3,829,302	8/1974	Hayner	117/126 GB

1. Glass fibers coated with an aqueous dispersion containing emulsified clad particles of a film former which clad particles have a core that consists of poly alkyl methacrylate and containing at least 5% by weight of methyl methacrylate, and an outer shell of a film forming polymeric material having a Tg of approximately 10°C or less.

8. Glass fibers having a coating thereon comprising the following solids in approximate percentages by weight:

Emulsified clad particles having a core consisting solely of a poly alkyl methacrylate material of which at least 5% is methyl methacrylate	20–70
Additional film former	0–40
Cationic lubricant	2–5
Nonionic lubricant	3–70
Humectant	0–7

said clad particles having an outer shell of a film forming polymeric material having a Tg of approximately 10°C or less.

B 417,498

DEVELOPMENT OF PHOTOGRAPHIC SILVER HALIDE ELEMENTS

Robert Joseph Pollet, Vremde; Camille Angelina Vandeputte, Mortsel; Francis Jeanne Sels, Kontich; Gerard Laurens Vanreusel, Hove; Jozef Frans Willems, Wilrijk, and George Frans van Veelen, Mortsel, all of Belgium, assignors to AGFA-GEVAERT, N.V., Mortsel, Belgium

Filed Nov. 20, 1973, Ser. No. 417,498

Claims priority, application United Kingdom, Dec. 7, 1972, 56630/72

Int. Cl.² G03C *5/30, 1/72, 1/28, 1/06*

U.S. Cl. 96—66.3 **22 Claims**

References Cited

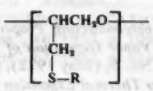
UNITED STATES PATENTS

3,046,129	7/1962	Graham et al.	96/66.3
3,046,133	7/1962	Minsk	96/114

FOREIGN PATENTS OR APPLICATIONS

1,494,509	9/1967	France	96/66 R

1. A method of developing a photographic element containing developable silver halide, said method including having a polyoxyethylene compound present in the element or in the developer bath during development, said polyoxyethylene compound comprising from about 20 to 100 mole percent recurring units of the formula:



and 80 to 0 mole percent recurring units of the formula:

wherein R represents an aliphatic, aromatic, or heterocyclic group, and X is halogen.

B 421,373

BENZOBICYCLOALKANE IMINES

Meier E. Freed, Paoli, and John R. Potoski, Spring City, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 262,849, June 14, 1972, Pat. No. 3,836,670, which is a continuation-in-part of Ser. No. 200,517, Nov. 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 94,983, Dec. 3, 1970, abandoned. This application Dec. 3, 1973, Ser. No. 421,373

Int. Cl.² C07C *119/14*

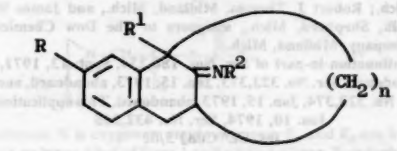
U.S. Cl. 260—566 R 12 Claims

References Cited

UNITED STATES PATENTS

3,796,717 3/1974 Smith et al. ..... 260/566 A

1. A compound of the formula:



wherein R is hydrogen, lower alkyl, lower alkyloxy, hydroxy, phenyl lower alkyloxy wherein phenyl may be unsubstituted or substituted with lower alkyl or lower alkyloxy, lower alkanoyloxy of from 2 to 7 carbon atoms, lower cycloalkanoyloxy, aromatic hydrocarbon carbonyloxy, halogen, or trifluoromethyl; R^1 is lower alkyl, lower alkenyl, or phenyl lower alkyl wherein phenyl may be unsubstituted or substituted with lower alkyl or lower alkyloxy; R^2 is hydrogen, lower alkyl, or phenyl lower alkyl wherein phenyl may be unsubstituted or substituted with lower alkyl or lower alkyloxy; and *n* is an integer from 3 to 5 inclusive.

B 421,608

MANUFACTURE OF THIN LAYERS OF POLYURETHANE ELASTOMERS

Otto Volkert, Ludwigshafen; August Wigger, Frankenthal; Manfred Zuerger, Mannheim, and Peter Richter, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Dec. 4, 1973, Ser. No. 421,608

Claims priority, application Germany, Dec. 4, 1972, 2259360

Int. Cl.² B05D *3/06*

U.S. Cl. 427—54 17 Claims

References Cited

UNITED STATES PATENTS

2,948,611	8/1960	Barney	260/859 R
2,965,553	12/1960	Dixon et al.	260/859 R
3,008,917	11/1961	Park et al.	260/859 R
3,361,842	1/1968	Applegath et al.	117/93.31
3,624,045	11/1971	Stivers	204/159.19
3,812,063	5/1974	Kimura et al.	117/93.31

1. In a process for the formation on a substrate of thin polyurethane elastomeric layers of from about 0.2 to 5 mm thickness having a Shore hardness A of not more than 70° by curing a liquid polyurethane-elastomer-forming reaction mixture which consists essentially of

A. at least one polymeric material containing at least two hydroxyl groups in the molecule which are capable of reacting with isocyanates, said polymeric material being selected from the group consisting of polyesters, polyethers, polyester urethanes and polyether urethanes; and

B. diisocyanates or prepolymers drived from at least one of the hydroxyl-containing compounds mentioned under (A) above and diisocyanates, which prepolymers contain at least two isocyanate groups in the molecule,

which curing is effected by heating said mixture, the improvement which comprises: incorporating into said reaction mixture a minor amount of substantially compatible monomers having at least two photocrosslinkable double bonded carbon atoms prior to applying said mixture to the substrate; pouring said mixture onto said substrate to form a layer thereon; irradiating said layer to effect photocrosslinking of the monomers and gelling of the layer; and thereafter heating the layer to form a polyurethane elastomer.

B 426,157

SUBSTITUTED BIS-(DICARBOXYMETHYL)-ETHERS

Kent P. Lannert, Freeburg, Ill., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 19, 1973, Ser. No. 426,157

Int. Cl.² C07C *59/12*

U.S. Cl. 260—535 P 3 Claims

References Cited

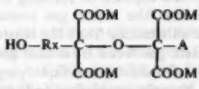
UNITED STATES PATENTS

3,293,176 12/1966 While ..... 260/535 P

FOREIGN PATENTS OR APPLICATIONS

2,248,708 4/1973 Germany ..... 260/535 P

1. A compound represented by the formula



wherein M is selected from the group consisting of alkali metal, ammonium, alkyl ammonium containing 1 to 4 carbon atoms and alkanol ammonium containing 1 to 4 carbon atoms; A is selected from the group consisting of hydrogen, methyl, ethyl, —CH_2OH and RxOH; and Rx is

Rz being selected from the group consisting of hydrogen, alkyl, alkoxy alkyl, and —COOM, the total number of carbon atoms in Rx being from 2 to 22.

B 427,946

THIO-SUBSTITUTED 2-OXO-INDOLINES

Richard E. Holmes, Indianapolis, and Glen P. Jourdan, Martinsville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 26, 1973, Ser. No. 427,946

Int. Cl.² C07D *209/34*

U.S. Cl. 260—325 R 5 Claims

References Cited

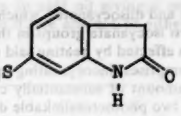
UNITED STATES PATENTS

3,767,653 10/1973 Krapcho ..... 260/325 R

OTHER PUBLICATIONS

Gassman et al., "Chem. Abstracts," Vol. 78, p. 394, No. 159359f, (1973).

1. A compound of the formula



in which R_2 is C_1–C_3 alkyl, benzyl, halobenzyl, nitrobenzyl, C_1–C_3 alkylbenzyl, or phenyl.

B 428,386

PROCESS FOR TREATING WASTE GAS IN REPROCESSING OF USED NUCLEAR FUEL

Kunio Kamiya; Hideo Yusa; Fumito Nakajima, all of Hitachi, and Masato Takeuchi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 428,386

Claims priority, application Japan, Dec. 27, 1972, 47-129897

Int. Cl.² C01F *13/00*

U.S. Cl. 423—249 **13 Claims**

References Cited

UNITED STATES PATENTS

3,501,923	3/1970	Lehmer	252/301.1 W
3,748,864	7/1973	Lofredo et al.	252/301.1 W

1. A process for separating and recovering Kr-85 by cryogenic distillation from a waste gas evolving from reprocessing of used nuclear fuel, which comprises removing explosive, gaseous substances and materials capable of forming the explosive, gaseous substances from the waste gas containing Kr-85, removing condensible substances from the waste gas, thereby obtaining a clean waste gas freed from said gaseous substances and condensible substances, and liquefying and distilling the clean waste gas, thereby separating and recovering Kr-85 from the clean waste gas.

B 429,027

SYNTHESIS OF AROMATIC AMINES BY REACTION OF AROMATIC COMPOUNDS WITH AMMONIA

Thomas W. Del Pesco, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Dec. 19, 1973, Ser. No. 429,027

Int. Cl.² C07C *85/02*

U.S. Cl. 260—296 R **6 Claims**

References Cited

UNITED STATES PATENTS

3,231,616	1/1966	Jones	260/581

FOREIGN PATENTS OR APPLICATIONS

553,988	3/1958	Canada	260/581

OTHER PUBLICATIONS

Squire, "Chem. Abstracts," Vol. 76, pp. 338–339, Abstract Nos. 24890k, 24891m, 24892n, (1972).

Squire, "Chem. Abstracts", Vol. 78, p. 328, Abstract No. 3941d, (1973).

1. In a process for aminating an aromatic compound selected from benzene, pyridine and aniline by reaction with ammonia at a temperature of from about 150°C. to about 500°C. and at a pressure of from about 10 to about 1000 atmospheres in the presence of a cataloreactant comprising nickel/nickel oxide/zirconium oxide wherein the ratio of nickel to nickel oxide is from 0.001:1 to 10:1 and the ratio of total nickel to zirconium oxide is from 0.1:1 to 100:1 that was conditioned by (1) reducing in hydrogen from about 10 to 90% of the nickel oxide to metallic nickel and (2) oxidizing with an oxygen containing gas, the improvement which comprises carrying out the reaction in intimate molecular contact with the conditioned cataloreactant which is treated with from about 0.01 to about 20 moles of ammonia per mole of total nickel in the conditioned cataloreactant at a temperature of from about 20°C. to about 500°C. for from about 1 to about 60 minutes prior to introduction to the amination reactants.

B 432,265

CELLULOSIC SIZING AGENTS

Lewis E. Chumbley; Lawrence L. Sams, II, both of Lake Jackson; Russell T. McFadden, Freeport; Juan Longoria, III, Lake Jackson, all of Tex.; Donald A. Tomalia, Midland, Mich.; Robert J. Thomas, Midland, Mich., and James W. Lalk, Shepherd, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. Nos. 180,234, Sept. 13, 1971, abandoned, Ser. No. 323,373, Jan. 15, 1973, abandoned, and Ser. No. 323,374, Jan. 15, 1973, abandoned. This application Jan. 10, 1974, Ser. No. 432,265

Int. Cl.² C08J *3/02*

U.S. Cl. 106—213 **27 Claims**

References Cited

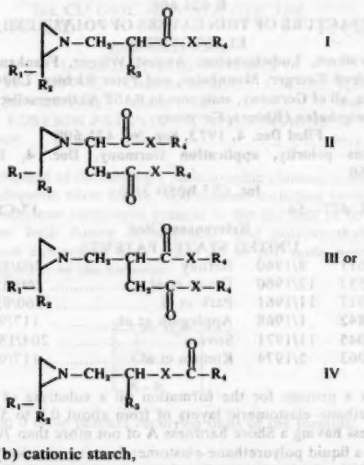
UNITED STATES PATENTS

2,626,931	1/1953	Bestian	260/2 EN
2,698,793	1/1955	Landes et al.	162/164
3,198,754	8/1965	Ahlbrecht et al.	260/239 E
3,346,527	10/1967	Lagally	162/158
3,575,796	3/1971	Brown et al.	162/158
3,622,528	11/1971	Langoria	162/164

OTHER PUBLICATIONS

Dermer & Ham, "Ethylenimine and Other Aziridines" Academic Press, (1969), pp. 133, 160, 161.

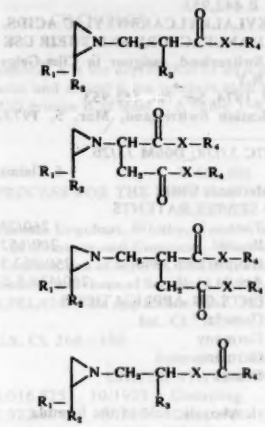
1. A mixture of (a) a ring-opened aziridinyl homopolymer of an aziridinyl monomer corresponding to the formula



and (b) cationic starch,

wherein: X is oxygen or amido nitrogen, R_1 and R_2 are hydrogen or lower alkyl of from 1 to 4 carbon atoms, R_3 is hydrogen or methyl and R_4 is an organic hydrophobic group.

15. In the process of sizing cellulosics, the improvement consisting of applying to a cellulosic, in an amount sufficient to size same, a sizing agent comprising a ring-opened aziridinyl homopolymer of an aziridinyl monomer corresponding to the formula



I

II

III or

IV

wherein: X is oxygen or amido nitrogen, R_1 and R_2 are hydrogen or lower alkyl of from 1 to 4 carbon atoms, R_3 is hydrogen or methyl and R_4 is an organic hydrophobic group.

B 433,707

POWDERED CLEANING COMPOSITION OF UREA-FORMALDEHYDE

Helmut Hermann Froehlich, and William Jacob Lautenberger, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Co., Wilmington, Del.

Continuation-in-part of Ser. No. 394,263, Oct. 8, 1973, abandoned, which is a continuation of Ser. No. 209,402, Dec. 17, 1971, abandoned. This application Jan. 16, 1974, Ser. No. 433,707

Claims priority, application France, Dec. 15, 1972, 72.44806; Germany, Dec. 15, 1972, 2261587; Japan, Dec. 16, 1972, 47-125837; United Kingdom, Dec. 15, 1972, 58090/72

Int. Cl.² C11D *1/38, 1/50, 3/26*

U.S. Cl. 252—544 **5 Claims**

References Cited

UNITED STATES PATENTS

2,250,379	7/1941	Johnson	252/544 X
2,789,095	4/1957	Lindvig	252/DIG. 2
3,533,953	10/1970	Mills et al.	252/88

FOREIGN PATENTS OR APPLICATIONS

2,015,972	4/1970	France

1. A powdered cleaning composition having a soil substantivity constant greater than 1.5 and consisting essentially of about 30 to 90% particulate polymeric ureaformaldehyde and about 10 to 70% fluid, the urea-formaldehyde having a particle size of about from 10 to 105 microns, an oil absorption value of no less than 90, fiber hardness and a bulk density of at least 0.2 g./cc., and the fluid consisting essentially of up to 100% water containing sufficient surfactant to give a surface tension of less than 40 dynes per centimeter and up to 100% of organic liquid selected from high boiling hydrocarbon solvents, tetrachloroethylene, methyl chloroform, 1,1,2-trichloro-1,2,2-trifluoroethane, an aliphatic alcohol containing from 1 to 4 carbon atoms, and mixtures of these.

B 433,930

CROSSLINKED, INTERPOLYMER FIXED-CHARGE MEMBRANES

Harry P. Gregor, Leonia, N.J., assignor to Harry P. Gregor, Leonia, N.J.

Division of Ser. No. 166,606, July 27, 1971, Pat. No. 3,808,305. This application Jan. 15, 1974, Ser. No. 433,930

Int. Cl.² B01D *31/00, 13/00*

U.S. Cl. 210—500 M **3 Claims**

References Cited

UNITED STATES PATENTS

3,004,904	10/1961	Gregor et al.	204/180 P
3,132,094	5/1964	McKelvey, Jr.	210/23
3,297,545	1/1967	Mindick et al.	204/180 P
3,451,951	6/1969	Mizutani et al.	260/2.1 E
3,647,086	3/1972	Mizutani et al.	210/500
3,737,045	6/1973	Hashimoto et al.	210/490

1. A chemically cross-linked non-fouling polymeric membrane including polyelectrolytes having fixed-charge groups and characterized by a hydraulic permeability of 10^{-2} to 10^{-7} cm/sec. atm. measured in water or dilute salt solution under a pressure of 60 to 100 psi, a water content of from about 15 to about 75%, and characterized by a uniform porosity which produces a salt rejection of from 1.0 to 85% measured using 0.01 M potassium chloride solution at 25°C and 60 to 100 psi.

B 438,048

SHAMPOO CREME RINSE CONTAINING A QUATERNARY AMMONIUM SACCHARINATE, CYCLAMATE OR PHTHALIMIDATE

Arnold W. Fogel, Montvale, and Anthony F. Mercurio, Rivervale, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 30, 1974, Ser. No. 438,048

Int. Cl.² A61K *7/06*

U.S. Cl. 424—70 **8 Claims**

References Cited

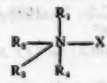
UNITED STATES PATENTS

2,928,772	3/1960	Anderson	424/70
3,496,110	2/1970	Shumway et al.	424/70
3,577,528	5/1971	McDonough et al.	424/70
3,642,977	2/1972	Hewitt	424/70
3,712,918	1/1973	Dudzinski et al.	424/70 X

OTHER PUBLICATIONS

Godfrey, J. Soc. Cosmetic Chemists, Vol. 17, No. 1, pp. 17–27, (1966).

1. A shampoo, creme rinse composition comprising, an aqueous carrier, an anionic or amphoteric detergent, or a combination thereof, the total amount of detergent being from about 10 to 55 parts, and from 0.1 to 1 part of a substituted quaternary ammonium compound represented by the formula:



where R_1 and R_2 are lower alkyl of 1 to 4 carbon atoms:

R_3 is a benzyl radical which may be further substituted by a C_1 or C_2 alkyl radical;

R_4 is a long chain alkyl radical of 16 to 22 carbon atoms; and

X is an organic anion selected from the group consisting of a saccharinate, a cyclamate and a phthalimidate radical said parts being per 100 parts of composition.

B 441,543
METHOD OF REFINING PYROMELLITIC ACID DIANHYDRIDE

Günther Richter, Eichenkamp, Germany, assignor to Gelsenberg Aktiengesellschaft, Essen, Germany

Filed Feb. 11, 1974, Ser. No. 441,543

Claims priority, application Germany, Feb. 16, 1973, 2307570

Int. Cl.² C07D 307/89

U.S. Cl. 203—73 **11 Claims**

References Cited

FOREIGN PATENTS OR APPLICATIONS

45-4052 2/1970 Japan

OTHER PUBLICATIONS

Mazitov et al., Khim. Prom. (Moscow) 1969, Vol. 45(2), pp. 98–99, Chem. Abstracts (1969) Vol. 70, 106153.

1. Process for purification of crude pyromellitic acid dianhydride produced by vapor oxidation of 1,2,4,5-tetraalkylbenzene with an oxygen containing gas, having a purity of more than about 95% pyromellitic acid dianhydride, which comprises the following steps:

a. distilling said crude pyromellitic acid dianhydride at pressure of about 90–160 Torr, and temperature of about 290°–350°C to distill overhead an impurities-containing fraction amounting to less than about 20% of the crude introduced into step (a), and provide a residue enriched in pyromellitic acid dianhydride,

b. distilling the residue of step (a) at lower pressure which is 70–120 Torr and at temperature of about 290°–325°C to distill overhead the purified pyromellitic acid dianhydride, and provide and impurities-containing residue of less than about 12% of the crude introduced into step (a).

B 442,431
3-AMINO-N-SUBSTITUTED SUCCINAMIC ACIDS AND INTERMEDIATES THERETO

Arthur H. Goldkamp, Bellevue, Wash.; Robert H. Mazur, Deerfield, and James M. Schlatter, Glenview, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 56,753, July 20, 1970, Pat. No. 3,803,223, which is a continuation-in-part of Ser. No. 704,229, Feb. 9, 1968, abandoned. This application Feb. 14, 1974, Ser. No. 442,431

Int. Cl.² C07C 103/50

U.S. Cl. 260—514 J **5 Claims**

References Cited

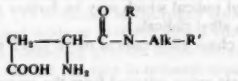
UNITED STATES PATENTS

3,487,105 12/1969 Grant et al. ..... 260/514 J

OTHER PUBLICATIONS

Liwschitz, Y. et al., J.A.C.S., 76, 3698 (1954).
Chem. Abstracts, 35:8156².
Chem. Abstracts, 42:7420h.

1. A compound of the formula



wherein R is hydrogen or a methyl radical, Alk is a lower alkylene radical and R′ is a cyclohexyl radical.

B 442,953
NEW PERFLUOROALKYLALKYLCARBOXYLIC ACIDS, PROCESS FOR THEIR MANUFACTURE AND THEIR USE

Horst Jäger, Bettingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 15, 1974, Ser. No. 442,953

Claims priority, application Switzerland, Mar. 5, 1973, 3184/73

Int. Cl.² C07C 53/34; D06M 13/20

U.S. Cl. 260—408 **6 Claims**

References Cited

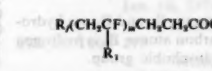
UNITED STATES PATENTS

2,951,051	8/1960	Tiers	260/23
3,016,406	1/1962	Brace	260/653
3,106,589	10/1963	Hauptschein et al.	260/653.3
3,641,083	2/1972	Anello et al.	260/438.5 C

FOREIGN PATENTS OR APPLICATIONS

696,239	10/1964	Canada
1,916,669	3/1970	Germany
2,104,750	2/1971	Germany
2,070,452	9/1971	France

1. A perfluoroalkylalkylcarboxylic acid of the formula



wherein R_f is an unbranched or branched perfluoroalkyl radical with 3 to 18 carbon atoms, R_1 is hydrogen or fluorine, and *m* is a whole number from 1 to 3.

B 444,078
LINEAR COPOLYMERS OF GLYCIDOL

Violete L. Stevens; Arthur R. Sexton, and Frederick P. Corson, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 20, 1974, Ser. No. 444,078

Int. Cl.² C08G 23/22

U.S. Cl. 260—47 EQ **8 Claims**

References Cited

UNITED STATES PATENTS

2,680,109	6/1954	Stevens et al.	260/88.3 A X
3,446,756	5/1969	Ramos	260/2 EP
3,509,074	4/1970	Kamio et al.	260/2 A
3,519,559	7/1970	Quinlan	260/2 A
3,578,719	5/1971	Kalopissis et al.	260/611 B

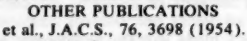
FOREIGN PATENTS OR APPLICATIONS

1,267,259	3/1972	United Kingdom	260/2

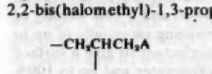
OTHER PUBLICATIONS

Chem. Abst. Vol. 66, p. 2877, 1967.

1. Compounds of the formula



wherein R is the residue left by the removal of n active hydrogen atoms from an initiator compound, RH_n; each R′ independently is an alkylene radical selected from the group consisting of ethylene, trimethylene, tetramethylene, 1,2-butylene, 2,2-bis(halomethyl)-1,3-propylene, and groups of the formula



each A independently is H, Cl, Br, or OX; each X independently is H or the acyl radical of a carboxylic acid with the proviso that at least one R′ is 3-hydroxy-1,2-propylene and at least one is a group of the formula

$$-CH_2CHCH_2OX$$

wherein X is the acyl radical of an α,β-unsaturated carboxylic acid; and m and n are integers such that the total number of R'O groups is at least 2, n being 1–8.

B 455,806

PROCESS FOR THE MANUFACTURE OF PLASTIC PIRN SLEEVES

Thomas Urquhart, Whitby, Canada, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 332,189, Feb. 13, 1973, abandoned, which is a division of Ser. No. 117,013, Feb. 19, 1971, Pat. No. 3,752,414. This application Mar. 28, 1974, Ser. No. 455,806

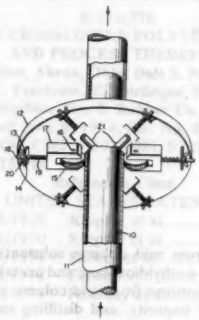
Int. Cl.² B29D *15/00*

U.S. Cl. 264—150 **6 Claims**

References Cited

UNITED STATES PATENTS

2,016,425	10/1935	Goessling	264/322 X
2,922,194	1/1960	Lampard	264/209
2,948,919	8/1960	Matthews	264/150 X
3,089,187	5/1963	Wolfe	264/210 X
3,095,161	6/1963	Atwood et al.	242/159
3,435,107	3/1969	Conrad	264/293 X
3,600,918	8/1971	Lemelson	264/132 X



1. A process for preparing a plastic pirn sleeve comprising:

a. extruding a thermoplastic material in the shape of a tube;

b. adjusting the temperature of the tube until its external surface is just above the softening point of the material and suitable for indenting;

c. indenting the external surface of the tube longitudinally along its length along at least three separate paths while maintaining the shape of the tube, said indentations being longitudinal rows about 1/32 to ½ inch wide of circumferential grooves spaced uniformly in the range of 30–70 grooves per inch said grooves having a lateral profile that is chordal or lunal with a maximum depth peak-to-valley of 0.002 to 0.010 inch and tapering at either end to be essentially flush with the blank areas between the longitudinal rows of indentations;

d. cooling the tube below the softening point of the material and

e. cutting the tube into predetermined lengths.

B 456,905

PARTIAL OR COMPLETE SEPARATION OF GAS MIXTURES, CONTAINING AMMONIA AND CARBON DIOXIDE

Wilhelm Berkel, Mutterstadt, and Hans Gettert, Mannheim, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Apr. 1, 1974, Ser. No. 456,905

Claims priority, application Germany, Apr. 7, 1973, 2317603

Int. Cl.² B01D *53/14*

U.S. Cl. 55—70 **8 Claims**

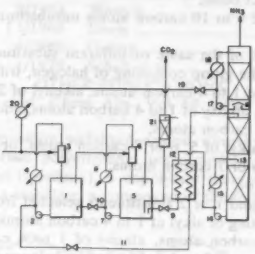
References Cited

UNITED STATES PATENTS

2,950,173	8/1960	Baroni et al.	55/70 X
3,315,442	4/1967	Yuan et al.	55/70
3,607,047	9/1971	Broom et al.	55/70 X
3,647,872	3/1972	Kaasenbroud et al.	55/70 X
3,691,729	9/1972	DeRooy et al.	55/70

OTHER PUBLICATIONS

A. V. Slack et al., "Ammonia" Part I, 1973, pp. 67–68.



1. A process for the separation of a gas mixture containing ammonia and carbon dioxide by absorption in a solvent, which process comprises carrying out the absorption of said gas mixture in a mixing zone in which water as the solvent and said gas mixture are intimately mixed and thereafter separating non-absorbed gas mixture and water from one another, the residence time of the gas in the mixing zone being limited to a maximum of 0.1 second in order to absorb the ammonia to a substantially greater extent than the carbon dioxide.

B 459,408

PYRAZOL-5-ONE PHARMACEUTICAL COMPOSITIONS AND METHODS FOR EFFECTING DIURESIS, SALURESIS AND FOR TREATING HYPERTENSION

Eike Müller; Karl Meng, both of Wuppertal; Egbert Wehinger, Neviges; and Harald Horstmann, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 9, 1974, Ser. No. 459,408

Claims priority, application Germany, Apr. 17, 1973, 2319278

Int. Cl.² A61K *31/415*

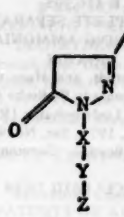
U.S. Cl. 424—273 **68 Claims**

References Cited

OTHER PUBLICATIONS

Chemical Abstracts, Vol. 80, item 95943y and item 82965g (1974).

1. A pharmaceutical composition useful for effecting diuresis and saluresis and for treating hypertension in humans and animals which comprises a diuretic, saluretic or antihypertensive amount of a pyrazol-5-one of the formula:



or a pharmaceutically acceptable nontoxic salt thereof wherein

R is amino;

X is methylene wherein 1 hydrogen atom is substituted by lower alkyl, ethylene or ethylene wherein 1 hydrogen atom is substituted by lower alkyl or 1 hydrogen atom on each of the two carbon atoms is substituted by lower alkyl;

Y is a direct bond;

Z is aryl of 6 to 10 carbon atoms unsubstituted or substituted by:

a. 1 or 2 of the same or different substituents selected from the group consisting of halogen, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, and alkenoxy of 2 to 4 carbon atoms;

b. cycloalkyl of 5, 6 or 7 carbon atoms, or cycloalkenyl of 5, 6 or 7 carbon atoms;

c. nitro; or

d. nitro and 1 or 2 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkenoxy of 2 to 4 carbon atoms, halogen and trifluoromethyl;

in combination with a pharmaceutically acceptable nontoxic inert diluent or carrier.

B 466,304

RECOVERY OF ANHYDROUS DIOXANE EXTRACTIVELY DISTILLED WITH DIOLS OR ALKAHOLAMINE

Dieter Wolf, Gruenstadt; Eberhard Bender, and Theodor Weber, both of Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed May 2, 1974, Ser. No. 466,304

Claims priority, application Germany, May 5, 1973, 2322709

Int. Cl.² B01D *3/00*

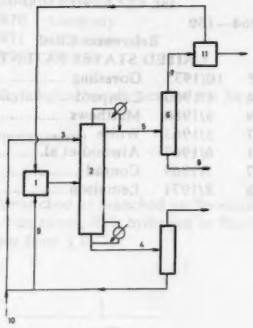
U.S. Cl. 203—59 **3 Claims**

References Cited

UNITED STATES PATENTS

1,681,861	8/1928	Knorr et al.	260/340.6
1,879,637	9/1932	Reid	260/340.6
2,072,101	3/1937	Dreyfus	260/340.6
2,273,923	2/1942	Bludworth	203/64
3,035,060	5/1962	Binning et al.	260/340.6
3,310,478	3/1967	Amir	203/64
3,584,737	6/1971	Gresselmann	260/340.6

1. A process for the recovery of substantially anhydrous dioxane from a reaction mixture containing dioxane and minor amounts of water, 1-methyldioxolane and acetaldehyde as impurities which comprises feeding dioxane containing minor amounts of water, 1-methyldioxolane and acetaldehyde as impurites to the middle portion of an extractive distillation column, also feeding to the top of said column a solvent selected from the group consisting of ethylene glycol, diethylene glycol, triethylene glycol, propylene glycol, dipropylene glycol, tripropylene glycol, propanetriol, propanediol, butanediol, a mono-lower alkanolamine, a di-lower alkanolamine, a tri-lower alkanolamine, and mixtures thereof at proportions of said solvent to dioxane in the range of 0.1:1 to 100:1, distilling



off as overhead from said column substantially anhydrous dioxane plus the 1-methyldioxolane and acetaldehyde impurities, removing as bottoms from said column said solvent and most of the water impurity, and distilling said overhead to recover substantially pure dioxane.

B 466,419

SILVER COMPOSITIONS

Oliver Alton Short, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 2, 1974, Ser. No. 466,419

Int. Cl.² H01B *1/02*

U.S. Cl. 106—1 **4 Claims**

References Cited

UNITED STATES PATENTS

3,849,142	11/1974	Conwicke	106/1

OTHER PUBLICATIONS

Jacobson et al., *Encyclopedia of Chem. Reactions*, Vol. 6, 1956, pp. 143, 147 and 150.

1. In silver metallizing compositions useful for producing silver patterns on glass substrates, said compositions comprising finely divided silver particles and a particulate glass binder dispersed in an inert liquid vehicle, the improvement comprising, as said silver particles, silver-halide coated silver.

B 468,603

NON-FOAMING LUBRICATION OIL

Jan Willem van Hesden, Baulkham Hills, Australia, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 9, 1974, Ser. No. 468,603

Claims priority, application Australia, May 31, 1973, 3505/73

Int. Cl.² C10M 1/10

U.S. Cl. 252—25 4 Claims

References Cited

UNITED STATES PATENTS

2,411,671	11/1946	Smith et al.	252/34 X
2,533,878	12/1950	Clark et al.	252/33 X
2,991,248	7/1961	Preston et al.	252/358 X
3,086,944	4/1963	Wedell	252/358 X
3,111,381	11/1963	Panzer et al.	252/25 X
3,402,188	9/1968	Wiese	252/358 X
3,464,923	9/1969	Roche et al.	252/25 X
3,471,403	10/1969	Lesuer et al.	252/39

FOREIGN PATENTS OR APPLICATIONS

209,175	11/1956	Australia	252/33

OTHER PUBLICATIONS

Ross, "Chemical Antifoaming Agents", May 1949, Chemical Industries, pp. 757–759.

Kalichevsky et al., "Petroleum Refining with Chemicals", 1956, pp. 649–651.

1. A lubrication oil composition having improved resistance to foaming in use comprising a lubrication oil and a foam preventing amount of an annydrous alkali metal or alkaline earth metal compound selected from the group consisting of oxides, sulfates and halides.

B 476,776

RADIATION CROSSLINKED POLYVINYL CHLORIDE AND PROCESS THEREFOR

Georg G. A. Böhm, Akron, Ohio; Dale S. Pearson, Hauppauge, and James O. Tveekrem, E. Patchogue, both of N.Y., assignors to The Firestone Tire & Rubber Co., Akron, Ohio

Filed June 6, 1974, Ser. No. 476,776

Int. Cl.² C08F 8/00; C08L 91/00, 27/22

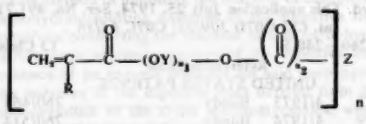
U.S. Cl. 204—159.16 12 Claims

References Cited

UNITED STATES PATENTS

3,539,488	11/1970	Klopfer et al.	204/159.17
3,542,661	11/1970	Klopfer et al.	204/159.17
3,785,849	1/1974	Parker et al.	204/159.22
3,816,559	6/1974	Farone	260/884
3,816,564	6/1974	Holliday et al.	260/884

1. Polyvinyl chloride compositions curable by high energy ionizing radiation comprising polyvinyl chloride having an average molecular weight of from about 50,000 to 150,000, together with from about 2% to 50% of at least one curing agent having the general formula:



wherein:

R is hydrogen or methyl

n is 1 to 4

n_1 is 0 or 1

n_2 is 0 or 1

Y is a bifunctional, aliphatic organic radical which may be linear or branched and may be substituted with an acrylic or methacrylic radical or with a radiation stable group, and

Z is an alicyclic group, an aryl group, or an aralkyl group which contains up to two carbon atoms in an exocyclic chain, said groups containing up to two alicyclic rings which may be fused, joined directly through a carbon atom on each ring or bridged together through a carbon or oxygen atom; with the proviso that n_1 and n_2 are not both zero in the same compound; if n_2 is one, n_1 is one; and if n is one Y must contain an acrylic or methacrylic function.

B 479,556

PLASTICS MATERIAL STABILIZED AGAINST ULTRAVIOLET RADIATION

Walter Luders, Neu-Isenburg, and Edgar Fischer, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 14, 1974, Ser. No. 479,556

Claims priority, application Germany, June 18, 1973, 2330979

Int. Cl.² C08K 5/52

U.S. Cl. 260—45.8 R 10 Claims

References Cited

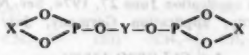
UNITED STATES PATENTS

2,952,701	9/1960	McConnell et al.	260/927
3,047,608	7/1962	Friedman et al.	260/927
3,133,043	5/1964	Rosenfelder et al.	260/45.8
3,149,181	9/1964	Warren	260/848
3,283,037	11/1966	Davis	260/927
3,437,720	4/1969	Guttag	260/927
3,488,407	1/1970	Schall et al.	260/927

OTHER PUBLICATIONS

Mukmeneva et al., Chem. Abs., Vol. 58, 1963, 8943a.

1. A composition stabilized against ultraviolet radiation which comprises polyethylene, polypropylene, polybutene, poly(4-methyl-1-pentene), a copolymer thereof or polystyrene and, as a stabilizer, a compound of the formula



wherein X is phenylene or phenylene substituted by halogen, alkyl of up to 5 carbon atoms or carboalkoxy and Y is phenylene or phenylene substituted by halogen, alkyl of up to 5 carbon atoms or carboalkoxy, provided at least one of X or Y is substituted by carboalkoxy.

B 481,989

METHOD OF INJECTING POULTRY IN THE THIGH AND LEG PORTIONS WITHOUT PENETRATING THE SKIN

Arnold A. Bladow, Detroit Lakes, Minn., and Francis E. Ramsey, Shell Knob, Mo., assignors to Swift & Company, Chicago, Ill.

Filed June 24, 1974, Ser. No. 481,989

Int. Cl.² A23L 1/315

U.S. Cl. 426—281 3 Claims

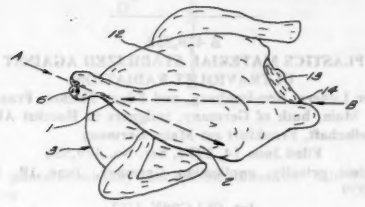
References Cited

UNITED STATES PATENTS

2,162,047	6/1939	Allen	426/221 X
3,035,508	5/1962	Nelson	99/533
3,119,696	1/1964	Williams	426/281
3,511,164	5/1970	Strandine et al.	99/532
3,835,223	9/1974	Schwall et al.	426/281

1. A method for internally introducing an additive material into at least one of the interconnected thigh and leg portions of a poultry carcass, said method comprising: severing the feet from the poultry leg portions of a poultry carcass and pulling a number of tendons from said leg portions; engaging and fully extending a leg of said carcass before the attainment of rigor mortis, said leg being extended so as to substantially align the femur and fibular bones at a minimum angle to the back of the carcass; inserting a single long multiple orifice needle into an empty tendon sheath from which a tendon has been pulled and

advancing said needle through said sheath and beneath the poultry skin substantially parallel to said fibula and through the flesh of said leg, across the joint between said fibula and femur and substantially through the length of the flesh portion



of said thigh and substantially parallel to said femur without penetrating the skin of said thigh and leg portions; and introducing an additive under pressure through said needle orifices into the flesh of at least one of said interconnected thigh and leg portions.

B 483,746

N-CARBOXYLATED N-METHYLCARBAMIC ACID ARYL ESTERS

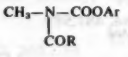
Engelbert Kuhle, Bergisch-Gladbach; Peter Siegle, Cologne; Wolfgang Behrenz, Cologne, and Ingeborg Hammann, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 265,843, June 23, 1972, Pat. No. 3,857,860. This application June 27, 1974, Ser. No. 483,746
Claims priority, application Germany, July 2, 1971, 2132936
Int. Cl.² C07C *125/06*
U.S. Cl. 260—479 C **4 Claims**

References Cited
UNITED STATES PATENTS

2,599,737	6/1952	Adelson	260/479 C
3,111,539	11/1963	Bocker et al.	260/479 C
3,555,076	1/1971	Thoma et al.	260/479 C
3,657,324	3/1972	Sheppard et al.	260/479 C
3,789,033	1/1974	Hagemann et al.	260/479 C

1. An N-carboxylated N-methylcarbamic acid aryl ester of the formula



in which

Ar is phenyl, naphthyl, or phenyl or naphthyl substituted one or more times by a lower alkyl, alkenyl, alkynyl, alkoxy, alkenoxy, alkynoxy, alkylmercapto, alkenylmercapto or alkynylmercapto each of up to 4 carbon atoms, or by dimethylamino, trifluoromethyl, chlorine, bromine, fluorine nitro, cyano, cycloalkyl of 5 or 6 ring carbon atoms substituted with lower alkyl of 1 to 4 carbon atoms, or by N,N-dimethyl- or N,N-diethylformamidino, or by a lower dialkoxymethyl radical; and

R is optionally substituted lower alkoxy, alkenoxy, alkynoxy or alkylmercapto each with 1 to 4 carbon atoms, or anilino, chloranilino, nitroanilino, methoxy anilino, or $-NR'_2$ wherein R′ is individually selected from the group consisting of hydrogen and alkyl, alkenyl, cycloalkyl or cycloalkenyl each of up to 12 carbon atoms, phenylmercapto or phenylmercapto substituted by lower alkyl of 1 to 4 carbon atoms or chlorine, or OAr.

B 485,972

PROCESS FOR ISOLATION OF ASPARTYL DIPEPTIDE ESTERS

Walter G. Farkas, Ruvigliana, Switzerland; Willard M. Hoehn, Cupertino, Calif., and Joseph F. Zawadzki, Skokie, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 337,927, March 5, 1973, abandoned. This application July 5, 1974, Ser. No. 485,972
Claims priority, application Canada, Feb. 25, 1974, 193344
Int. Cl.² C07C *103/52;* **A23L** *1/22*
U.S. Cl. 260—112.5 R **9 Claims**

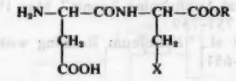
References Cited
UNITED STATES PATENTS

3,678,026	7/1972	Ariyoshi et al.	260/112.5
3,695,898	10/1972	Hill et al.	260/112.5

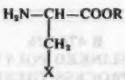
FOREIGN PATENTS OR APPLICATIONS

2,040,473	1/1971	France
2,107,411	8/1971	Germany

1. In a process for preparing a dipeptide ester of the general formula



wherein X is a phenyl or p-hydroxyphenyl radical, R is an alkyl radical containing 1 to 7 carbon atoms and the stereochemical configuration is L-L; by the reaction of an L-aspartic acid anhydride salt with a compound of the formula



wherein R and X are defined as above, the step of isolating said dipeptide ester from the crude reaction mixture containing said ester which comprises partitioning said crude mixture between water and a suitable alkanol containing up to 5 carbon atoms and isolating the dipeptide ester from the alkanol layer.

B 491,711

PROSTAGLANDIN DERIVATIVES

Wenling Kao, Devon, and Donald P. Strike, St. Davids, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 485,411, July 3, 1974, abandoned. This application July 25, 1974, Ser. No. 491,711
Int. Cl.² C07D *309/22;* **C07C** *61/36*
U.S. Cl. 260—240 R **13 Claims**

References Cited
UNITED STATES PATENTS

3,728,382	4/1973	Bundy	260/468 D
3,804,889	4/1974	Bundy	260/514 D
3,804,890	4/1974	Bundy	260/514 D
3,812,172	5/1974	Bundy	260/514 D
3,812,179	5/1974	Bundy	260/514 D
3,845,042	10/1974	Strike et al.	260/240 R

OTHER PUBLICATIONS

Guzman et al., Chem. & Industry (London) 1973, pp. 635–636.
Grudzinskas et al., Tet. Letters, 1973, No. 2, pp. 141–144.
Vogel et al., Helvetia Chim. Acta 56 (1973), pp. 557–560.

1. A compound of the structure:

wherein A is CHOH or C=O; R is H or alkyl of from 1 to 6 carbon atoms, and

i. X is a single bond; or

ii. X is a trans double bond.

B 493,463

GLYCOSIDE-HYDROLASE ENZYME INHIBITORS

Werner Frommer; Walter Puls, both of Wuppertal-Elberfeld; Dietmar Schüfer, Neuhof near Fulda, and Delf Schmidt, Wuppertal-Vohwinkel, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 213,066, Dec. 28, 1971, Pat. No. 3,876,766. This application July 31, 1974, Ser. No. 493,463 Claims priority, application Germany, Dec. 28, 1970, 2064092

Int. Cl.² C12B *13/00*

U.S. Cl. 195—31 R **1 Claim**

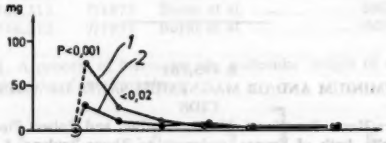
References Cited

UNITED STATES PATENTS

3,127,315	3/1964	Tardrew et al.	421/115
3,629,404	12/1971	Flørent et al.	195/80 R

OTHER PUBLICATIONS

Niwa et al., "Nojirimycin," as a Potent Inhibitor of Glucosidase," Agr. Biol. Chem., Vol. 34, No. 6, pp. 966–968, (1970).



1. A method of inhibiting the reaction of carbohydrates and carbohydrate-splitting enzymes of the digestive tract which comprises conducting the reaction of said carbohydrates and carbohydrate-splitting enzymes of the digestive tract in the presence of an enzyme inhibitor for said carbohydrate-splitting enzymes of the digestive tract derived from a strain of microorganism of the order Actinomycetales, wherein said enzyme inhibitor:

a. is substantially heat-stable at neutral pH values;

b. is stable to acid at pH 2;

c. is stable to alkali at pH 12;

d. is slowly dialyzable;

e. is not inactivated by trypsin or pepsin;

f. does not inhibit trypsin or pepsin;

g. is not receptive to protein dyes;

h. is free from characteristic UV absorption up to 250 nm.;

i. is not inhibited by urea or β-mercaptoethanol;

j. is of molecular weight 500–6000; and

k. yields a monosaccharide on hydrolytic splitting.

B 493,474

POLYOXETANES WHICH CAN BE USED IN PEPTIDE SYNTHESIS

Jean Bouchaudon, Morsang-sur-Orge; Guy Bourat, Bourg-la-Reine, and Rodolphe Margraff, Ris Orangis, all of France, assignors to Rhone-Poulenc, S.A., Paris, France

Division of Ser. No. 335,177, Feb. 23, 1973, Pat. No. 3,847,868. This application July 31, 1974, Ser. No. 493,474 Claims priority, application France, Feb. 28, 1972, 72.06696

Int. Cl.² B01D *31/00*

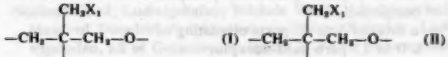
U.S. Cl. 210—500 M **12 Claims**

References Cited

UNITED STATES PATENTS

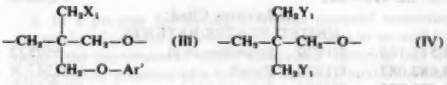
3,459,687	8/1969	Bufton	260/2 XA

1. A membrane consisting of a polyoxetane which consists of essentially of a plurality of units of the formula:

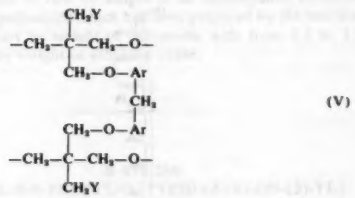


and

and, optionally, of units of at least one of the formulae:



and



in which:

each of X_1 and X_2, which may be identical or different, represents a chlorine or bromine atom,

Y as defined under X_1 or represents a radical of formula: $-O-Ar-CH_2X_2$ or $-O-Ar'$,

each of the Y_1 radicals, which may be identical or different, represents a $-O-Ar'$ or $-O-Ar-CH_2X_2$ radical,

Ar represents a divalent aromatic radical, the two free valencies of which are carried by carbon atoms of one or two aromaic benzene rings and

Ar' represents the radical —ARH,

the units (I) to (V) being connected to one another via the oxygen atom with a free valency of one of the units and a methylene group with a free valency of the adjacent unit, and a screen reinforcement.

B 493,537

FLUOROELASTOMER COMPOSITION

Robert E. Kolb, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 406,832, Oct. 16, 1973, abandoned. This application Aug. 1, 1974, Ser. No. 493,537

Int. Cl.² C08F *29/16, 27/08, 45/72*

U.S. Cl. 260—47 UP 7 Claims

References Cited

UNITED STATES PATENTS

3,400,065	9/1968	Barth	204/159.2
3,655,727	4/1972	Patel	260/47 UP
3,686,143	8/1972	Bowman	260/47 UP

1. A curable fluoroelastomer composition consisting essentially of elastomeric co-polymer of vinylidene fluoride and terminally ethylenically unsaturated fluorinated comonomer and for each hundred parts thereof:

a. 0.2 to 5 parts diorganosulfur oxide, which contains two like or unlike unsubstituted or neutrally substituted aliphatic, cycloaliphatic or aromatic groups

b. 0.1 to 5 parts quaternary phosphonium or ammonium compound,

c. a total of 3 to 40 parts consisting of

i. 0 to 25 parts acid acceptor

ii. 0 to 25 parts optional base

d. 0.2 to 5 parts aromatic hydroxy or amino compound.

B 493,686

METHOD FOR INJECTING A LIQUID ADDITIVE INTO POULTRY FLESH WITHOUT PENETRATING THE SKIN

Eldon J. Strandine, Chicago, and Carl H. Koonz, Northbrook, both of Ill., assignors to Swift & Company, Chicago, Ill.

Filed Aug. 1, 1974, Ser. No. 493,686

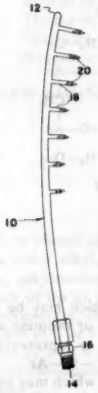
Int. Cl.² A23L *1/315*

U.S. Cl. 426—281 4 Claims

References Cited

UNITED STATES PATENTS

3,511,164	5/1970	Strandine et al.	99/532
3,682,087	8/1972	Panek	128/347 X
3,835,223	9/1974	Schwall et al.	426/281 X



1. A method for injecting an additive material into the flesh of a poultry carcass, said method comprising: inserting a comb-like injector instrument between the flesh and the skin by pulling the skin away from the flesh at a point where the skin is cut open from the flesh and advancing said instrument along a portion of the carcass, said injector instrument having a hollow manifold portion and a plurality of hollow tines extending perpendicular thereto in a plane along said manifold, and said instrument being first held with the tines substantially parallel to the surface of said flesh; turning said injector instrument to point said tines into said flesh whereby the skin is stretched from said flesh; embedding said plurality of tines into said flesh without penetrating the skin and until said manifold rests against the surface thereof; and introducing an additive under pressure through said hollow manifold and through said tines and into said flesh while the tines are embedded therein.

B 494,138

PROSTAGLANDIN DERIVATIVES

Donald P. Strike, St. Davids, and Wen-Ling Kao, Devon, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 384,769, Aug. 1, 1973, Pat. No. 3,845,042. This application Aug. 2, 1974, Ser. No. 494,138

Int. Cl.² C07C *149/26*

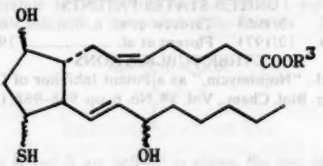
U.S. Cl. 260—514 D 2 Claims

References Cited

OTHER PUBLICATIONS

Grudzinskas et al. Tet. Lett. 141 (1973).

1. A compound of the formula:



wherein R^3 is hydrogen or lower alkyl.

B 495,781

ALUMINIUM AND/OR MAGNESIUM SALTS OF AMINO-ACIDS

André Henri Passedouet, Maisons-Laffite, and Robert Pipon, Melle, both of France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed Aug. 8, 1974, Ser. No. 495,781

Claims priority, application France, Aug. 9, 1973, 73.29163; June 26, 1974, 74.22228

Int. Cl.² C07F *5/06*

U.S. Cl. 260—448 R 7 Claims

References Cited

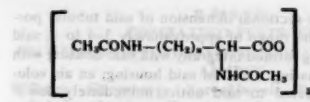
UNITED STATES PATENTS

2,480,743	8/1949	Krantz et al.	260/448 R
2,588,090	3/1952	Delmar	260/448 R
2,907,781	10/1959	Hermelin	260/448 R
3,450,752	6/1969	Inklaar	260/448 R X
3,534,094	10/1970	Koenig et al.	260/534
3,651,137	3/1972	Yee	260/534 L
3,651,137	3/1972	Yee et al.	260/534 L
3,787,466	1/1974	Kagawa et al.	260/448 R
3,809,760	5/1974	Thely	260/534 R
3,836,551	9/1974	Schroeder et al.	260/448 R X

OTHER PUBLICATIONS

Chemical Abstracts, V. 76, 60071c (1972).
Chemical Abstracts, V. 65, 17233*f* (1966).
Chemical Abstracts, V. 77, 168641y (1972).

1. A salt of the formula:



wherein the amino-acid moiety is of the D or L form or a mixture of the D and L forms, *n* represents 3 or 4, a represents an integer from 1 through 10, *b* represents an integer from 1 through 9, and *d* represents an integer from 1 through 19, the numbers represented by the indices *a*, *b* and *d* being connected by the relationship $a + d = 3b$.

B 497,490

POLYMERIZING BIS-MALEIMIDES

Gaetano F. D'Alelio, South Bend, Ind., assignor to University of Notre Dame du Lac, Notre Dame, Ind.

Continuation-in-part of Ser. No. 363,799, May 25, 1973, Pat. No. 3,890,272. This application Aug. 14, 1974, Ser. No. 497,490

Int. Cl.² C08G *73/12*

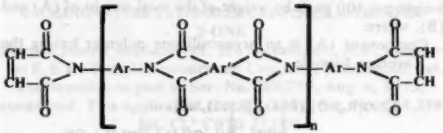
U.S. Cl. 260—78 UA **27 Claims**

References Cited

UNITED STATES PATENTS

3,576,691	4/1971	Meyers	156/309
3,671,490	6/1972	Bargain	260/47
3,708,459	1/1973	Lubowitz	260/65
3,748,310	7/1973	Burns et al.	260/78.4
3,748,311	7/1973	Burns et al.	260/78.4
3,748,312	7/1973	Burns et al.	260/78 A

1. A process of increasing the molecular weight of a bis-maleimide of the formula:

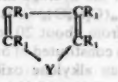


wherein

Ar is a divalent aromatic organic radical,

Ar′ is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar′ radical, and

n is 0 or a positive integer of 1 to 20, comprising: reacting at a temperature in the range of about 5°–100°C. one mole of the bis-maleimide with from 1 to 2 moles of a cyclic diene of the formula:



wherein

Y is —O—, —S—, or

and each

R_1 is hydrogen or an aliphatic hydrocarbon of 1 to 4 carbon atoms with the proviso that the sum of the R_1's is no greater than 4 carbon atoms,

and thereafter thermally eliminating a portion of the cyclic diene at a temperature in the range of about 30°–120°C. to extend the bis-maleimide in molecular weight to at least a dimer of the bis-maleimide.

20. The adduct of claim **18** wherein Z is —O—.

B 497,571

LEVELLING AUXILIARIES FOR ACID DYES

Norbert Greif, Ludwigshafen; Michele Vescia, Limburgerhof; Manfred Daeuble, Frankenthal, and Hans Heinrich, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 15, 1974, Ser. No. 497,571

Claims priority, application Germany, Aug. 29, 1973, 2343418

Int. Cl.² D06P *1/649, 5/06*

U.S. Cl. 8—169 **6 Claims**

References Cited

UNITED STATES PATENTS

3,232,695	2/1966	Robim et al.	8/169
3,473,956	10/1969	McIntyre et al.	8/173
3,619,123	11/1971	Walz et al.	8/173

1. In a process for dyeing a fibrous material consisting essentially of polyamide fibers with an acid dye in an acid pH range, the improvement which comprises: carrying out the dyeing in the presence of a levelling auxiliary mixture which, based on the solids in each case, contains:

a. from 30 to 90% by weight of a surfactant containing one or more sulfonic acid groups in salt form; and

b. from 10 to 70% by weight of an oxyethylated synthetic linear polyamide which has been prepared by the reaction of 1 part by weight of polyamide with from 2.5 to 3.5 parts by weight of ethylene oxide.

B 498,288

O-ETHYL-S-N-PROPYL-O-[PYRIDAZ-(6)-ON-(3)-YL]-THIONOTHIOLPHOSPHORIC ACID ESTERS

Wolfgang Hofer; Fritz Maurer; Hans-Jochem Riebel; Lothar Rohe, all of Wuppertal; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 16, 1974, Ser. No. 498,288

Claims priority, application Germany, Aug. 30, 1973, 2343741

Int. Cl.² C07F *9/40*

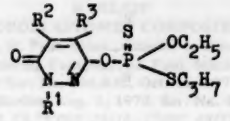
U.S. Cl. 260—250 P **6 Claims**

References Cited

UNITED STATES PATENTS

2,759,937	8/1956	Du Breuil	260/250
2,759,938	8/1956	Du Breuil	260/250
3,310,560	3/1967	Schonbeck et al.	260/250
3,547,920	12/1970	Fest et al.	260/250

1. An O-ethyl-S-n-propyl-O-[pyridaz-(6)-on-(3)-yl]-thionothiolphosphoric acid ester of the formula



in which

R^1 is hydrogen, alkyl with 1 to 6 carbon atoms, or alkyl with 1 to 6 carbon atoms carrying a substituent selected from nitrile, halogen, alkoxycarbonyl, alkylcarbonyl, alkoxy and alkylthio, in each case with 1 to 4 carbon atoms in the alkyl moiety; methyl substituted by pyrrolidine, piperidine or thiophene-1,1-dioxide; alkenyl or alkynyl with 2 to 6 carbon atoms; phenyl or phenyl carrying one substituent selected from halogen, alkyl with 1 to 4 carbon atoms, nitro, nitrile, alkoxy and alkylthio, each with 1 or 2 carbon atoms and 2 to 5 halogen atoms; pyrrolidine, piperidine or thiophene-1,1-dioxide, and

R^2 and R^3 each independently is hydrogen or alkyl with 1 to 4 carbon atoms, or together are $(CH)_4$ forming a fused benzene ring with the adjoining carbon atoms.

B 502,151

INTERNAL COMBUSTION ENGINE AIR INDUCTION ASSEMBLY

Helmut Schonberger, Ginsheim; Manfred Wolfsberger, and Walter Funke, both of Russelsheim, all of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 30, 1974, Ser. No. 502,151

Claims priority, application Germany, Sept. 12, 1973, 2345930

Int. Cl.² B01D 27/08

U.S. Cl. 55—417 **1 Claim**

References Cited

UNITED STATES PATENTS

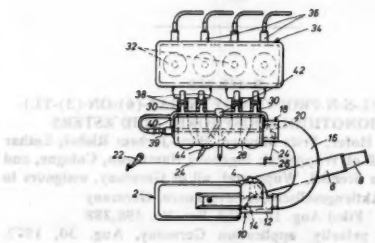
2,886,129	5/1959	Streete	55/276
3,530,648	9/1970	Ravenel	55/276
3,628,515	12/1971	Knapp et al.	123/119 R
3,823,696	7/1974	Mutschler et al.	123/119 R

FOREIGN PATENTS OR APPLICATIONS

1,340,660	9/1963	France	55/276
1,303,763	8/1962	France	55/276

OTHER PUBLICATIONS

Def. Pub. S.N. 775389 4/69, Hansen.



1. An air induction assembly for an engine comprising: an air filter housing defining an interior with an inlet and an outlet therein for the passage of air through said housing interior; an air filter element supported in said housing interior between said inlet and said outlet so that air flowing therebetween is filtered; means in said housing for smoothing the flow of air discharged from said housing interior through said outlet including a generally tubular portion which extends from said outlet into said housing interior with an inlet and terminating downstream from said filter element; the ratio between the length and the cross-sectional dimension of said tubular portion falling within the range of approximately 3–4 to 1; said tubular portion being formed integrally with said housing with a portion thereof sharing a wall of said housing; an air volumeter fluidly connected to said outlet immediately downstream from said air smoothing means to receive air therefrom and including a pivotally mounted back-pressure valve member; restoring force producing means operably connected to said valve and normally maintaining it in a closed position during periods when the engine is inactive whereby said valve is moved to a more open position against said restoring force producing means by the flow of air through said outlet, the angular extent of said rotation corresponding to the volume of air flowing therepast; a branch pipe fluidly connected to said flow straightening tubular portion through said shared wall and near said inlet end to permit the passage of fluid therethrough into said tubular portion a sufficient distance upstream from said air volumeter to prevent interference therewith whereby said branch pipe is adapted to be connected to a container of activated carbon for withdrawing fluid from said container.

B 503,776

ORGANOSILICONE POLYMER SOLUTIONS

Bela Prokai, Mahopac, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 420,233, Nov. 29, 1973, Pat. No. 3,887,500, which is a division of Ser. No. 279,883, Aug. 11, 1972, Pat. No. 3,846,462. This application Sept. 6, 1974, Ser. No. 503,776

Int. Cl.³ C08K 5/06; C08L 75/08, 83/12

U.S. Cl. 106—316 **5 Claims**

References Cited

UNITED STATES PATENTS

3,234,252	2/1966	Pater	260/448.2 N
3,657,305	4/1972	Morehouse	260/448.2 B
3,686,254	8/1972	Morehouse	260/448.2 B

1. Solution compositions comprising polymer Component (A) and solvent Component (B), said Component (A) being present in an amount from about 25 to about 80 parts by weight per 100 parts by weight of the total weight of (A) and (B), where:

Component (A) is an organosilicone polymer having the average formula,

$$R_3SiO[R_2SiO]_x[RSiO]_y[RSiO]_zSiR_3$$

$$\qquad\qquad\qquad\qquad\quad R'CN \quad R''_p(OC_2H_4)_n(OC_3H_6)_mOW$$

wherein: R is an alkyl group having from 1 to 10 carbon atoms; R′ is a bivalent alkylene or a bivalent oxyalkylene group the oxygen atom of which is bonded to silicon; R″ is an organic radical comprising a bivalent alkylene radical a carbon atom of which is bonded to silicon; W comprises a monovalent hydrocarbyl group having from 1 to 12 carbon atoms; p has a value of zero or one; x has an average value of from about 10 to about 200; y has an average value of from 3 to about 100; z has an average value of from about 2 to about 30; and m and n are numbers such that the average molecular weight of the chain, $-(C_3H_6O)_m(C_2H_4O)_n-$, is from about 1,000 to about 6,000 and from about 20 to about 65 weight per cent of the chain is constituted of oxyethylene units; and

Component (B) is an alkylene oxide adduct of butanol having the formula $C_4H_9(OC_3H_6)_s(OC_2H_4)_uOH$, wherein the average value of s is from about 8 to about 50 and the average value of u is from about 6 to about 40.

B 510,836
COMBATING PESTS WITH DICHLOROVINYLTHIONOPHOSPHORIC ACID ESTER AMIDES

Wilhelm Sirrenberg, Sprockhovel; Bernhard Homeyer, Opladen; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 267,759, June 30, 1972, abandoned. This application Sept. 30, 1974, Ser. No. 510,836

Claims priority, application Germany, July 3, 1971, 2133200

Int. Cl.² A01N 9/36

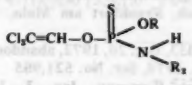
U.S. Cl. 424—219 **8 Claims**

References Cited

UNITED STATES PATENTS

2,861,912	11/1958	Sallmann	260/957 X
3,264,184	8/1966	Geiger et al.	260/957 X
3,632,692	1/1972	Morales	260/957 X
3,652,742	3/1972	Sirrenberg et al.	260/957
3,745,198	7/1973	Soloway et al.	260/957

1. A method of combating a pest slected from the group consisting of of insects, acarids and nematodes which comprises applying to such pest or its habitat an insecticidally, acaricidally or nematocidally effective amount of a dichlorovinylthionophosphoric acid ester amide of the formula



in which

R is methyl, isopropyl, isobutyl or sec.-butyl, and

R_2 is methyl, ethyl, propyl or allyl.

B 514,259
METHOD OF MAKING 4-AMINO-6-T-BUTYL-3-MERCAPTO-1,2,4-TRIAZIN-5-ONE

Mitchell Joseph Bogdanowicz, Jr., Spencerport, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 385,750, Aug. 6, 1973, abandoned. This application Oct. 11, 1974, Ser. No. 514,259

Int. Cl.² C07D 253/06

U.S. Cl. 260—248 AS **9 Claims**

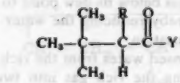
References Cited

UNITED STATES PATENTS

3,544,570	12/1970	Timmler et al.	260/248

1. A method of making 4-amino-6-t-butyl-3-mercapto-1,2,4-triazin-5-one which comprises:

a. reacting a compound of the formula:



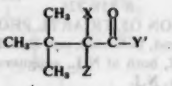
I

where

R is H, Br or Cl and

Y is Cl, Br or OH;

with Br_2 or Cl_2, in the presence of a catalyst when Y is OH, to produce a compound of the formula:

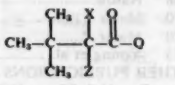


II

where X and Z are each independently Cl or Br and Y′ is Cl or Br; then, contacting the compound with a compound selected from R^1OH, R^1SH and R^2R^3NH, where R^1 is H, C_1–C_4 alkyl, phenyl, benzyl,

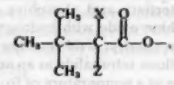
an alkali metal cation, or an alkaline earth metal cation, and R^2 and R^3 are each independently H, C_1–C_4 alkyl, phenyl or benzyl;

to form a compound of the formula:



III

where Q is $-OR^1$, $-SR^1$, $-NR^2R^3$ or



then

b. reacting the product of step a. with thiocarbohydrazide in a polar inert solvent.

B 516,804
HALOMETHANESULFONAMIDES FOR ERADICATING INTERNAL PARASITES

Bruce Adam Forsyth, Croydon, and Richard Burridge Warner, Ringwood, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Oct. 21, 1974, Ser. No. 516,804

Claims priority, application Australia, Nov. 13, 1973, 5637/73; Nov. 27, 1973, 5787/73

Int. Cl.² A01N 9/16

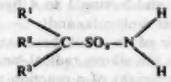
U.S. Cl. 424—321 **7 Claims**

References Cited

UNITED STATES PATENTS

3,607,935	9/1971	Hilmer et al.	424/321
3,609,187	9/1971	Moore et al.	424/321
3,622,625	11/1971	Wolf et al.	424/321
3,795,743	3/1974	Okuda et al.	424/321

1. A method of treating a warm blooded animal to eradicate internal parasites selected from the group consisting of trematodes and nematodes; which method comprises orally or parenterally administering to said warm blooded animal an effective amount of a composition comprising as active ingredient a compound of the formula



wherein R^1, R^2 and R^3 which may be the same or different are hydrogen, or halogen and at least two of R^1, R^2, and R^3 are halogen.

B 518,326

PREPARATION OF TRIARYL PHOSPHINES

John Melvin Townsend, Belleville, and Donald Herman Valentine, Jr., Westfield, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 425,012, Dec. 14, 1973, abandoned. This application Oct. 29, 1974, Ser. No. 518,326

Int. Cl.² C07F 9/02

U.S. Cl. 260—606.5 P 14 Claims

References Cited

UNITED STATES PATENTS

3,261,871	7/1966	Fritzsche et al.	260/606.5 P
3,280,195	10/1966	Fritzsche et al.	260/606.5 P
3,342,871	9/1967	Maier	260/606.5 P
3,405,180	10/1968	Natoli	260/606.5 P
3,496,235	2/1970	Maier	260/606.5 P
3,534,104	10/1970	Maier	260/606.5 P
3,780,111	12/1973	Young et al.	260/606.5 P

OTHER PUBLICATIONS

Fritzsche et al., Chem. Ber. Vol. 97 pp. 1988–1993 (1964).

1. A process for producing a tertiary aryl phosphine from the corresponding tertiary aryl phosphine oxide comprising reacting said phosphine oxide with hydrogen in the presence of sulfur or selenium catalyst, said reaction being carried out in the presence of silicon tetrahalide as an auxiliary agent, said reaction taking place at a temperature of from 50°C. to 400°C. and pressures of from 100 p.s.i.g. to 2000 p.s.i.g.

B 520,995

REACTION PRODUCTS OF PHENOLSULPHONIC ACID-REA-FORMALDEHYDE AS TANNING AGENTS AND PROCESS FOR THEIR MANUFACTURE

Albert Würmli, Reihen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 5, 1974, Ser. No. 520,995

Claims priority, application Switzerland, Nov. 8, 1973, 15715/73

Int. Cl.² C08G 75/20, 75/24; C14C 3/20

U.S. Cl. 8—94.24 13 Claims

References Cited

UNITED STATES PATENTS

2,127,068	8/1938	Muller	260/49
2,129,553	9/1938	Russell et al.	260/49
2,271,245	1/1942	Biedermann	260/49
2,716,098	8/1955	Biedermann	260/49
2,809,088	10/1957	Meister et al.	8/94.21
3,010,779	11/1961	Komarek et al.	8/94.18
3,475,113	10/1969	Sellet	260/49
3,852,374	12/1974	Erdmann et al.	8/94.24

FOREIGN PATENTS OR APPLICATIONS

683,084	11/1952	United Kingdom

1. Reaction product of phenolsulphonic acid-urea-formaldehyde from

A 100 parts by weight of a condensation product from

a. 1 mole of a hydroxyphenylsulphone-hydroxyphenylmonosulphonic acid having 1 to 4 hydroxyphenylsulphone groups per molecule, and

b. 0.1 to 0.6 mole of an alkoxybenzene having 1 to 4 carbon atoms in the alkoxy radical, and

B 10 to 40 parts by weight of a reaction product or of a mixture of

c. 1 mole of urea and/or of a urea derivative and

d. 1 to 4 moles of formaldehyde or of an agent releasing formaldehyde.

B 521,025

COMPLEXES OF MACROCYCLIC POLYETHER WITH MERCAPTOIMIDAZOLINES

Charles John Pedersen, Salem, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 93,424, Nov. 27, 1970, Pat. No. 3,873,569. This application Nov. 5, 1974, Ser. No. 521,025

Int. Cl.² C07D 49/34

U.S. Cl. 260—309.6 5 Claims

References Cited

UNITED STATES PATENTS

3,804,900	4/1974	Hickner et al.	260/309.7 X

1. A complex of (A) a member of the group consisting of mercaptoimidazolines, and (B) a macrocyclic polyether having a macrocyclic ring of carbon and oxygen atoms totaling 15–60 ring atoms, each oxygen in the ring being separated from its adjoining oxygens in the ring by 2 or 3 carbon atoms, and the macrocyclic ring being fused by a pair of vicinal carbon atoms to 1–4 carbocyclic rings of the group: (a) phenylene, naphthylene, phenanthrylene, and anthrylene, (b) saturated analogs of (a), and (c) monosubstituted derivatives of (a) wherein the substituent is tertiary butyl.

B 521,985

PROCESS FOR PRODUCING HIGH-METHANE GAS

Helmut Liebgott, Bad Homburg, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 317,033, Dec. 20, 1972, abandoned. This application Nov. 7, 1974, Ser. No. 521,985

Claims priority, application Germany, Jan. 3, 1972, 2200004

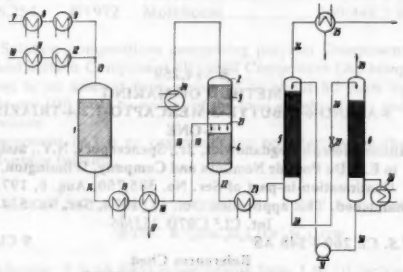
Int. Cl.² C07C 27/06

U.S. Cl. 260—449 M 3 Claims

References Cited

UNITED STATES PATENTS

3,511,624	5/1970	Humphries et al.	260/449 M
3,870,738	3/1975	Yamamoto et al.	260/449 M



1. Process for producing high-methane gas which comprises:

a. catalytically cracking liquid hydrocarbons with water vapor at elevated temperatures and pressures to produce a rich gas containing less than 15% hydrogen by volume;

b. cooling the rich gas below its dew point to a temperature below 150°C thereby reducing the water vapor content thereof by condensation;

c. separating condensed water from the rich gas;

d. thereafter dividing the rich gas into two streams and feeding same to a hydrogenation zone containing two catalyst layers,

i. one of said streams being preheated to a temperature of at least 250°C and then being fed to the first catalyst layer of said zone, said one stream constituting 50–70% of the total rich gas,

ii. the other of said streams being fed between the catalyst layers of said zone without preheating where it is mixed with the gas discharged from the first catalyst layer thereby cooling same and thereafter further reacting said mixture in the second catalyst layer thereby producing a product gas; and

e. scrubbing the product gas leaving the hydrogenation zone to remove carbon dioxide.

B 524,849

4-TRICYCLO[5,2,1,$0^{2,6}$]DECYL-8-BUTANAL

Theodor Leidig, Holzminden, Germany, assignor to Haarmann & Reimer Gesellschaft mit beschrankter Haftung, Holzminden, Germany

Filed Nov. 18, 1974, Ser. No. 524,849

Claims priority, application Germany, Nov. 30, 1973, 2359659

Int. Cl.² C07C *47/30*

U.S. Cl. 260—598 **1 Claim**

References Cited

UNITED STATES PATENTS

2,817,673	12/1957	Roelen et al.	260/598 X
2,875,244	2/1959	Bartlett et al.	260/598 X
3,786,075	1/1974	Telsseire et al.	260/611 F

1. 4-Tricyclo [5,2,1,$0^{2,6}$] decyl-8-butanal.

B 527,040

PROCESS FOR THE PREPARATION OF THE ANTIBIOTIC 20.798 R.P.

Jean Florent; Jean Lunel, and Jacques Renaut, all of Paris, France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed Nov. 25, 1974, Ser. No. 527,040

Claims priority, application France, Nov. 27, 1973, 73.42191

Int. Cl.² C12B *1/00*

U.S. Cl. 195—80 R **15 Claims**

References Cited

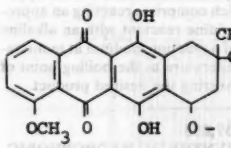
UNITED STATES PATENTS

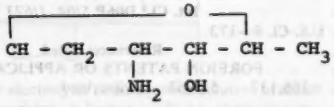
3,562,112	2/1971	Gibian et al.	195/51 R

FOREIGN PATENTS OR APPLICATIONS

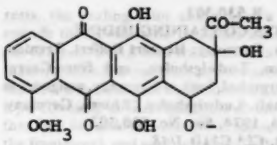
1,322,872	7/1973	United Kingdom	195/80 R

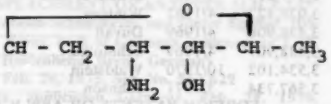
1. Process for the preparation of the antibiotic 20,798 RP of the formula:





or an acid addition salt thereof, which comprises the microbiological reduction of daunorubicin of the formula:





or of an acid addition salt thereof using *Streptomyces lavendulae* (ATCC 8664), *Streptomyces roseochromogenes* (ATCC 13400). *Corynebacterium simplex* (ATCc 6946) or *Bacterium cyclooxydans* (ATCC 12673), to convert the grouping –CO—CH_3 to —$CHOHCH_3$.

B 529,194

HEAT PIPE SYSTEM

Helmut L. Kroebig, Rolling Hills, and Frank J. Riha, III, Los Angeles, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 3, 1974, Ser. No. 529,194

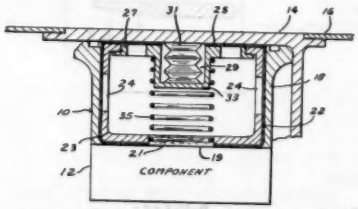
Int. Cl.² F28D *15/00*

U.S. Cl. 165—32 **2 Claims**

References Cited

UNITED STATES PATENTS

3,229,755	1/1966	Komarow	165/32
3,399,717	9/1968	Cline	165/32
3,414,050	12/1968	Anand	165/105 X
3,519,067	7/1970	Schmidt	165/32



1. A heat pipe diode device for transferring heat from a heat source component to a heat sink wall comprising: a heat pipe body member attached to said component; said component having a wall forming at least a portion of the normal evaporator section of the heat pipe diode device; a working fluid within said body member; a cover for said heat pipe diode device forming at least a portion of the said heat sink wall; said cover forming the normal condenser for said heat pipe diode device; a wick connected between the condenser and the evaporator of said heat pipe diode device; means for retaining the wick adjacent the heat pipe wall; a wick support plate adjacent said cover; said wick being attached to said support plate; means for holding said wick in contact with said cover; means, responsive to excessive temperatures at said heat sink wall, for moving said support plate and a portion of said wick away from said cover to thereby substantially reduce heat flow in the reverse direction through said heat pipe diode device.

B 530,303
SURFACTANTS CONTAINING IODINE

Paul Diessel, Mannheim, Germany; Herbert Helfert, Trenton, Mich.; Reiner Hamm, Ludwigshafen, and Hans-Georg Scharpenberg, Limburgerhof, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Dec. 6, 1974, Ser. No. 530,303
Int. Cl.² C11D 3/48
U.S. Cl. 252—106 **4 Claims**

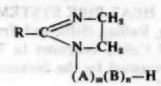
References Cited
UNITED STATES PATENTS

2,211,001	8/1940	Chwala	260/309.6
2,262,743	11/1941	De Groote et al.	252/344
2,977,315	3/1961	Scheib et al.	252/106
3,028,427	4/1962	Winicov	260/567.6
3,438,906	4/1969	Duvall	252/106
3,438,907	4/1969	Schmolka	252/106
3,534,102	10/1970	Waldstein	260/584
3,567,734	3/1971	Johnson	260/309.6

FOREIGN PATENTS OR APPLICATIONS

526,585	3/1954	Belgium
799,721	8/1958	United Kingdom

1. A detergent-iodine addition complex which yields a germicidally active amount of iodine, the detergent component of the complex being at least one compound of the formula



in which R is alkyl or alkenyl of 2 to 22 carbon atoms, A is an ethylene oxide radical, B is a propylene oxide radical, *m* is an integer from 10 to 30 and *n* is an integer from 3 to 10, and the ratio *n:m* is from 1:2 to 1:8, and the amount of iodine bound in said complex being from 15 to 40% by weight, based on the detergent component.

B 533,652
1,1,3-TRISUBSTITUTED HYDROXYGUANIDINES

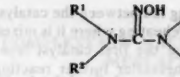
Saul Carl Cherkofsky, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 373,147, June 25, 1973, Pat. No. 3,867,447. This application Dec. 17, 1974, Ser. No. 533,652
Int. Cl.² C07C 133/10
U.S. Cl. 260—565 **5 Claims**

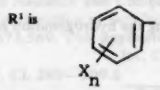
References Cited
OTHER PUBLICATIONS

German Offenlegungsschrift, 2,040,628 (2/24/72).
Belzecki et al., Bull. Acad. Polo. Des Sciences, Vol. 18, pp. 569–572 (1970).
Belzecki et al., J. Chem. Soc. Chem. Comm., pp. 806–807 (1970).
Braun et al., Ber. Vol. 36, pp. 3660–3663 (1903).

1. A compound of the formula



wherein

R^1 is  in which

X is F, Cl, Br, C_1–C_3 alkyl, C_1–C_3 alkoxy, NO_2, CF_3, R^4R^5NCO, $R^4R^5NSO_2$, or R^6SO_2;
R^2 and R^3 independently are methyl or ethyl;
R^4 and R^5 independently are H or C_1–C_4 alkyl;
R^6 is CF_3 or C_1–C_4 alkyl; and
n is 0 to 2.

B 536,322
HERBICIDAL 2-FLUORO-4-HALO-PHENYL-4,5,6,7-TETRAHYDRO-2H-ISOINDOLE-1,3-DIONES

Steven Jerome Goddard, West Grove, Pa., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 502,968, Sept. 3, 1974, abandoned. This application Dec. 24, 1974, Ser. No. 536,322
Int. Cl.² C07D 209/48
U.S. Cl. 260—326 HL **3 Claims**

References Cited
FOREIGN PATENTS OR APPLICATIONS

2,119,703	7/1972	France	260/326 HL

1. The compound 2-(4-chloro-2-fluorophenyl)-4,5,6,7-tetrahydro-2H-isoindole-1,3-dione.

3. The compound 2-(2,4-difluorophenyl)-4,5,6,7-tetrahydro-2H-isoindole-1,3-dione.

B 537,053
PREPARATION OF TETRACHLOROPYRIDINE

Stanley D. McGregor, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 27, 1974, Ser. No. 537,053
Int. Cl.² C07D 213/61
U.S. Cl. 260—290 HL **7 Claims**

References Cited
UNITED STATES PATENTS

3,232,947	2/1966	Haszeldine et al.	260/290

1. A method for preparing a member selected from the group of 2,3,4,5-tetrachloropyridine, 2,3,5,6-tetrachloropyridine and mixtures thereof, which comprises reacting an appropriate tetrachlorohydrazinopyridine reactant with an alkaline hypochlorite in the presence of a reaction medium at temperatures of from about room temperature to the boiling point of the reaction mixture and recovering the desired product.

B 537,058
DYEING AND PRINTING SYNTHETIC HYDROPHOBIC FIBERS WITH A CARRIER COMPRISING PHENYL CYCLOHEXANE AND DERIVATIVES

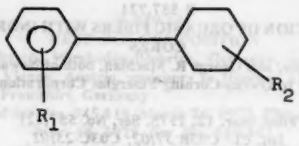
Kurt A. Dellian, and Jayanti V. Isharani, both of Greensboro, N.C., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 27, 1974, Ser. No. 537,058
Int. Cl.² D06P 5/04, 1/673
U.S. Cl. 8—173 **9 Claims**

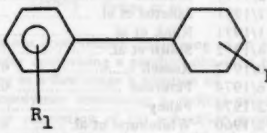
References Cited
FOREIGN PATENTS OR APPLICATIONS

368,137	5/1963	Switzerland	

1. In a process for coloring a textile fiber with a disperse, acid, basic or premetallized dyestuff with the aid of a carrier, the improvement comprising using as a carrier a compound of the general formula:



where
R_1 is hydrogen or lower alkyl; and
R_2 is hydrogen, lower alkyl, halogen or lower alkoxy.
6. A composition comprising
a. a compound of the formula



where
R_1 is hydrogen or lower alkyl; and
R_2 is hydrogen, lower alkyl, halogen or lower alkoxy, and
b. an anionic or nonionic surfactant, or mixture thereof.

B 542,258

ELECTROLYTIC CELL

Emile Cabaraux, Brussels, Belgium, assignor to Solvay & Cie, Belgium

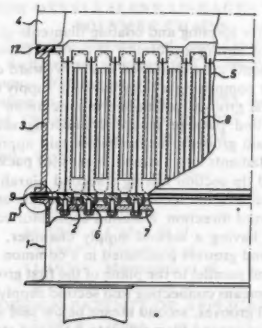
Filed Jan. 20, 1975, Ser. No. 542,258
Claims priority, application Belgium, Feb. 6, 1974, 140615
Int. Cl.² B01K *3/10*; C22D *1/02*
U.S. Cl. 204—252 **10 Claims**

References Cited
UNITED STATES PATENTS

3,030,295	4/1962	LaBarge	204/242
3,390,072	6/1968	Wiseman	204/266
3,591,483	7/1971	Loftfield et al.	204/252
3,632,497	1/1972	Leduc	204/266 X
3,857,775	12/1974	Custer et al.	204/266 X
3,869,375	3/1975	Ono et al.	204/279 X

FOREIGN PATENTS OR APPLICATIONS

1,124,317	8/1968	United Kingdom	204/242



1. A cell for the electrolysis of an aqueous solution of alkali metal halide, comprising, a bottom wall, an alternating sequence of substantially vertical and parallel anodes and cathodes supported by said bottom wall, peripheral sidewalls supported on the said base wall enclosing said cathodes and anodes, a sealing joint on which said peripheral sidewalls wall rests, the sealing joint comprising a framework which surrounds the anodes and cathodes made of flat, rigid bars, an envelope in which said framework is inserted and made of a material which is resistant to corrosion and has a hardness of the Shore A Scale between substantially 2 and 20, said envelope covering at least that part of the bars of the framework that face towards the interior of the cell and disposed between the framework and said peripheral sidewalls and bottom wall.

B 552,629

METHOD AND APPARATUS FOR DETECTING VERTICAL DISPLACEMENT OF AN UPPER SLICE LIP

Karl Wolf, Heidenheim-Schnaitheim, and Dieter Egelhof, Heidenheimbrenz, Brenz, both of Germany, assignors to J. M. Voith, GmbH, Heidenheim, Brenz, Germany

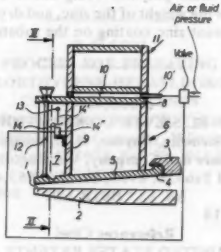
Filed Feb. 24, 1975, Ser. No. 552,629
Claims priority, application Germany, Feb. 28, 1974, 2409521
Int. Cl.² D21F *1/06, 7/06*
U.S. Cl. 162—198 **17 Claims**

References Cited
UNITED STATES PATENTS

3,463,701	8/1969	Curtis	162/347
3,645,843	2/1972	Schmaeng	162/347
3,738,910	6/1973	De Noyer	162/347

FOREIGN PATENTS OR APPLICATIONS

1,461,176	10/1969	Germany	162/347



15. In a papermaking method in which suspension flows from a headbox between horizontal upper and lower lips and through a horizontal discharge slot formed by the lips, that method of detecting vertical deflection of the upper lip in the laterally central region as caused by changes in the flow of suspension between the lips thereof by detecting means having first and second elements and which elements cause the detecting means to emit signals in conformity with relative vertical displacement of said elements, which comprises; supporting a first of said elements on the said central region of the upper lip, supporting the second of said elements stationarily on the end regions of the upper lip, said second element extending above said central region of the upper lip and in cooperating relation with the first element whereby the signals emitted by the detecting means are a measure of the vertical deflection of the central region of the upper lip, and adjusting the position of at least the central region of the upper lip in conformity with the signals emitted by said detector to effect said compensation.

B 552,709

METHOD FOR PRODUCING ZINC ANODE

Charles I. Sullivan, Melrose, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 408,925, Oct. 23, 1973, Continuation-in-art of Ser. No. 199,216, Nov. 16, 1971, abandoned. This application Feb. 24, 1975, Ser. No. 552,709

Int. Cl.² H01M 13/06

U.S. Cl. 427—123 5 Claims

References Cited

UNITED STATES PATENTS

2,738,375	3/1956	Schlotter	136/30
2,828,351	3/1958	Rade	136/126
2,838,590	6/1958	Garine	136/30
3,563,805	2/1971	Deierhol, Jr.	136/111
3,607,430	9/1971	Glover	136/111

1. A method for producing an anode assembly which comprises the steps of swelling an aqueous polymer latex with a solvent miscible with water, mixing the swollen latex polymer particles with zinc dust, coating an electrically conductive resin substrate with the thus-formed suspension of zinc dust in an aqueous latex of swollen particles of a binder polymer, the amount of the binder polymer being about 0.5 to 5 weight percent based on the weight of the zinc, and drying the coating to form an adherent zinc coating on the substrate.

B 553,421

NOVEL SILVER COMPOSITIONS

Samuel Jacob Horowitz, Snyder, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 26, 1975, Ser. No. 553,421

Int. Cl.² H01B 1/02

U.S. Cl. 252—514 18 Claims

References Cited

UNITED STATES PATENTS

2,819,170	1/1958	Short	106/48
3,293,501	12/1966	Martin	317/101
3,763,409	10/1973	Sheard	317/258
3,776,769	12/1973	Buck et al.	106/1
3,799,890	3/1974	Smith	252/514
3,799,891	3/1974	Smith	252/514

FOREIGN PATENTS OR APPLICATIONS

855,625	12/1960	United Kingdom

OTHER PUBLICATIONS

American Ceramic Society Bulletin 46, 789 (1967), "An Air Fired Gold–Copper Oxide Paste".

1. Silver compositions useful for forming highly adherent conductor patterns on ceramic dielectric substrates, said compositions comprising a glass-free mixture of finely divided inorganic powders dispersed in a liquid vehicle, the inorganic powders comprising, based upon the total weight of inorganic powders in the composition, 1–5% crystalline inorganic binder and 95–99% metal powder selected from among (i) Ag and (ii) Ag plus Pt, Pd, Au, an alloy of Cu with one or more of Pt, Pd, Au, and Ag, or mixtures thereof; wherein the weight ratio of Ag to other metals is at least 17/1; and wherein said crystalline inorganic binder consists essentially of bismuth oxide plus copper oxide, or lead oxide, or mixtures thereof, there being 0.3–6 parts by weight of copper oxide and/or lead oxide per part by weight of bismuth oxide.

B 557,721

PRODUCTION OF ORGANIC FIBERS WITH INORGANIC CORES

John L. Kane, and George R. Machlan, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 12, 1975, Ser. No. 557,721

Int. Cl.² C03B 37/02; C03C 25/02

U.S. Cl. 65—11 W 7 Claims

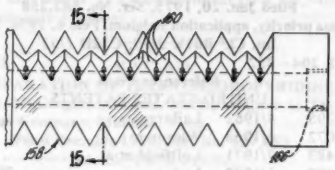
References Cited

UNITED STATES PATENTS

2,723,215	11/1955	Biefeld et al.	65/3 C
3,120,027	2/1964	Baggett et al.	118/419 X
3,268,312	8/1966	Grant	65/11 W X
3,323,941	6/1967	Dijk	118/410 X
3,334,980	8/1967	Smith	65/11 W
3,560,178	2/1971	Minkler	65/11 W
3,620,701	11/1971	Janetos et al.	65/3 C
3,622,290	11/1971	Klink et al.	65/3 R
3,653,860	4/1972	Smith et al.	65/11 W
3,695,858	10/1972	Russell	65/11 W X
3,817,728	6/1974	Peterson	65/11 W X
3,852,051	12/1974	Fahey	65/3 C
3,963,739	12/1960	Whitehurst et al.	65/11 W X

FOREIGN PATENTS OR APPLICATIONS

739,402	7/1966	Canada
1,036,607	7/1966	United Kingdom



1. Apparatus for forming and coating filaments comprising a first tip section having a plurality of orifices from which a first fan of filaments are attenuated in a downward direction, a first applicator comprising a body having a supply chamber, a plurality of first grooves positioned in a common generally vertical plane, and passage means connecting said supply chamber with said grooves, means below said applicator for gathering said filaments into a strand, means for packaging the strand, a second tip section having a second plurality of second orifices from which a second fan of filaments are attenuated in a downward direction, a second applicator comprising a second body having a second supply chamber, a second plurality of second grooves positioned in a common generally vertical plane and parallel to the plane of the first grooves, and second passage means connecting said second supply chamber with said second grooves, second means below said applicator for gathering said second filaments into a second strand, second means for packaging the second strand, and an oven between said first and second applicators at one end and said first and second gathering means at the other end, said oven having at least one passage extending therethrough with heating means on opposite sides thereof for heating the first and second filaments passing therethrough.

B 559,441

RESINOUS COMPOSITION

Kurt Hultzsch, Wiesbaden-Biebrich, Germany, and Helmut Fritze, Vienna, Austria, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Division of Ser. No. 345,116, March 26, 1973. This application Mar. 18, 1975, Ser. No. 559,441

Claims priority, application Germany, Mar. 29, 1972, 2215268; May 25, 1972, 2225351

Int. Cl.² C08F 8/44, 222/02

U.S. Cl. 260—33.6 UA **7 Claims**

References Cited

UNITED STATES PATENTS

3,511,798	5/1970	Isaacson	260/29.6
3,563,937	2/1971	Nickerson	260/33.4
3,775,381	11/1973	Hayashi	260/78.4 D
3,887,513	6/1975	Fritze et al.	260/33.6 UA

1. A resinous composition containing as an essential ingredient a binder comprising a product obtained by

I. reacting in a first stage a solution of

1. a copolymer containing a radical selected from the group consisting of (a) anhydride groups of vicinal carboxylic groups, (b) a combination of such anhydride groups with vicinal carboxylic groups, (c) a combination of said anhydride groups with other radicals capable of forming vicinal carboxylic groups and (d) a combination of said anhydride groups with vicinal carboxylic groups and with other radicals capable of forming vicinal carboxylic groups, at a temperature of 50° to 180°C, with

2. at least one alcohol containing up to 2 hydroxyl groups at least one of which being a non-tertiary hydroxy group to yield a reaction product in which at least a part of the anhydride groups is converted to semiester groups, and

II. reacting

3. the product thus obtained in the presence of water at a temperature in the range from 50° to 120°C with

4. a salt-forming compound of a polyvalent metal, the solvent present in the first stage of the reaction being compatible with said alcohol and partially miscible with water only to such an extent that two phases are formed therewith together with at least one pigment and an aromatic hydrocarbon as a solvent.

B 559,700

FIBERS OF ACID DYEABLE POLYESTER HAVING TETRAMETHYLPIPERIDINE GROUPS ATTACHED THROUGH OXYALKALENE LINKAGES TO ENDS OF POLYMER CHAINS

Murty S. Tanikella, Newark, Del., and Odorich von Susani, Geneva, Switzerland, assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 505,953, Sept. 13, 1974, abandoned. This application Mar. 19, 1975, Ser. No. 559,700

Int. Cl.² C08G 63/68

U.S. Cl. 260—75 N **10 Claims**

References Cited

UNITED STATES PATENTS

2,647,104	7/1953	Shivers	260/75
3,352,872	11/1967	Cislak et al.	260/293.63
3,372,143	3/1968	Terada et al.	260/47
3,624,181	11/1971	Munakata et al.	260/860
3,684,765	8/1972	Matsui et al.	260/45.8

FOREIGN PATENTS OR APPLICATIONS

32,434	8/1972	Japan

1. Acid-dyeable textile fibers or filaments of polyester containing a minor proportion, sufficient to provide at least 0.02 weight percent nitrogen, of 2,2,6,6-tetramethylpiperidine groups attached through oxyalkylene linkages to carboxylate units at the ends of polyester chains, said linkages being through the 1 or 4 positions of the tetramethylpiperidine ring, the oxyalkylene linkages consisting of oxyethylene or oxyethylene and oxypropylene, and there being an average of at least about 10 oxyalkylene units per tetramethylpiperidine group of which at least 5 are oxyethylene units.

B 559,701

ACID-DYEABLE FIBERS OF POLYESTER MODIFIED WITH TETRAMETHYLPIPERIDINE POLYETHER GLYCOLS

Murty S. Tanikella, Newark, Del., and Odorick von Susani, Geneva, Switzerland, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 505,952, Sept. 13, 1974, abandoned. This application Mar. 19, 1975, Ser. No. 559,701

Int. Cl.² C08G 63/68

U.S. Cl. 260—75 N **10 Claims**

References Cited

UNITED STATES PATENTS

2,647,104	7/1953	Shivers	260/75
3,624,181	11/1971	Munakata et al.	260/860

FOREIGN PATENTS OR APPLICATIONS

834,290	5/1960	United Kingdom

1. Acid dyeable polyester fibers or filaments comprising, as integral components in linear polyester chains, a minor proportion sufficient to provide at least 0.05 weight percent nitrogen, of 2,2,6,6-tetramethylpiperidine groups linked to dicarboxylate chain units through substituents at both the 1 and 4 positions of the piperidine ring which contain oxyethylene units, and the number of oxyethylene units in such linking substituents on tetramethylpiperidine groups in the polyester averages at least 10 oxyethylene units per tetramethylpiperidine group.

B 564,902

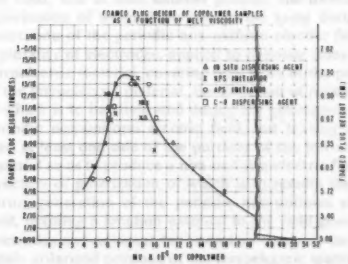
PROCESS FOR PREPARING TETRAFLUOROETHYLENE-HEXAFLUOROPROPYLENE COPOLYMER BLENDS

Miguel Jacinto Roura, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 3, 1975, Ser. No. 564,902

Int. Cl.² C08L 27/12

U.S. Cl. 260—900 **4 Claims**



1. A process which comprises heating separately in an atmosphere of air containing between about 3% and about 20% of water vapor, based on weight of atmosphere, at between about 340°C. and about 380°C. for a time sufficient to remove substantially all volatiles, groups of melt-processible copolymers of tetrafluoroethylene and hexafluoropropylene having between about 6.75 and about 27 weight percent hexafluoroethylene:

A. one said group of such copolymers comprising at least one or more copolymers having a melt viscosity that is between about 13×10^4 and 50×10^4 poise at 372°C.;

B. a second said group of such copolymers comprising at least one or more copolymers having a melt viscosity that is between about 1×10^4 and 5×10^4 poise at 372°C.; and

C. optionally, a third said group of such copolymers comprising at least one or more copolymers having a melt viscosity of between about 5×10^4 and 13×10^4 poise at 372°C.; and after heating, combining group (A) with group (B) and optionally group (C) in such a ratio so as to obtain a final blend product having a melt viscosity between 5×10^4 and 13×10^4 poise at 372°C.

B 566,556

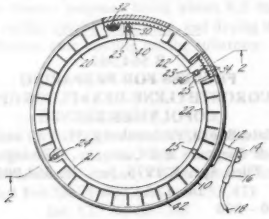
FULL-CIRCLE CONTACT ELECTRICAL SLIP-RING BRUSH

Harry T. Jensen, Milford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 9, 1975, Ser. No. 566,556
Int. Cl.² H01R *39/00*
U.S. Cl. 339—5 M **2 Claims**

References Cited
UNITED STATES PATENTS

2,414,543	1/1947	Moberly	339/5 S
3,489,982	1/1970	Dauphinee	339/5 R
3,724,067	4/1973	Tygard	339/5 M



1. A rotary electrical connection comprising:

an annular frame member;

a plurality of circular segment, self-lubricating, electrically conductive brush members loosely restrained within said annular frame member to provide substantially a full circle of electrical contact surface;

means resiliently urging said brush members into contact with said frame member;

means resiliently urging said brush members radially inward, thereby to ensure contact with a rotating member when disposed within said frame member; and

means providing for connection of an electrical conductor to said frame member.

B 567,076

COATING COMPOSITIONS COMPRISING TETRAFLUOROETHYLENE POLYMERS AND ALUMINUM HYDROXYCHLORIDE

John Wilmar Edwards, Welwyn Garden City, and Barry William Farrant, St. Neots, both of England, assignors to Imperial Chemical Industries Ltd., London, England

Division of Ser. No. 367,004, June 4, 1973, Pat. No. 3,900,684.
This application Apr. 11, 1975, Ser. No. 567,076
Claims priority, application United Kingdom, June 9, 1972, 27011/72
Int. Cl.² C08K *3/22*
U.S. Cl. 260—29.6 F **9 Claims**

References Cited
UNITED STATES PATENTS

2,592,147	4/1952	Ikeda	260/29.6 F
2,990,294	6/1961	Long	260/42.27
3,644,261	2/1972	Strolle	260/29.6 F
3,697,309	10/1972	Werner	117/72

1. A liquid composition comprising polytetrafluoroethylene polymer or copolymer and an aluminium hydroxychloride wherein the weight of aluminum provided by the aluminum hydroxychloride is at least 3 g per 100 g of polymer or copolymer.

B 570,721

HOT MELT SEALANTS

Richard Joseph Cella, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Apr. 23, 1975, Ser. No. 570,721
Int. Cl.² C08K *5/02*; C08F *218/14*
U.S. Cl. 260—33.8 UA **7 Claims**

References Cited
UNITED STATES PATENTS

2,599,123	6/1952	Pinkney et al.	260/78.5 R
3,904,588	9/1975	Greene	260/78.5 R

1. A hot melt adhesive comprising

a. 100 parts by weight of a random ethylene/methyl acrylate/maleic acid monoethyl ester polymer in which polymerized methyl acrylate units are present in the amount of about 50–60 wt. %, in which polymerized maleic acid monoethyl ester units are present in the amount of about 3–5 wt. %, and in which polymerized ethylene units are present in the amount of about 35 to 47 wt. %, the maleic acid monoethyl ester units are from 20 to 50% neutralized with ions selected from the class consisting of sodium ions and potassium ions;

b. about 50 to 150 parts by weight of an inorganic filler;

c. about 50 to 250 parts by weight of a tackifying resin, and

d. about 20 to 30 wt. %, based on the weight of the tackifying resin, of a plasticizer.

B 570,925

ACTIVATION OF WATER SOLUBLE AMINES BY HALOGENS FOR TRAPPING METHYL RADIOACTIVE IODINE FROM AIR STREAMS

Victor R. Deitz, 3310 Winnett Road, Chevy Chase, Md. 20015, and Charles H. Binchly, 1903 Tuckerman St., West Hyattsville, Md. 20782

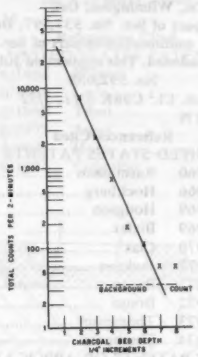
Filed Apr. 22, 1975, Ser. No. 570,925
Int. Cl.² B01D *53/04*
U.S. Cl. 55—71 **1 Claim**

References Cited
UNITED STATES PATENTS

3,429,103	2/1969	Taylor	55/74
3,453,807	7/1969	Taylor	55/74

1. In the method of removing methyl iodine ^{131} gas from the effluent of a reactor by passing the effluent gas through an organic impregnated charcoal, the improvement comprising employing an impregnated charcoal prepared by contacting

charcoal with an aqueous mixture of a halogen selected from the group consisting of iodine and bromine, and a tertiary amine selected from the group consisting of hexamethylenetetramine, triethyanolamine, triethylenediamine, N-methylmorpholine, N, N, N′, N′-tetramethylethylenediamine, 1,



dimethylamino-2-propanol, N-methylpiperazine, and N, N, N′, N′-tetramethyl-1,4-butanediamine, wherein the concentration of halogen in the charcoal is between 0.4 and 1.6%, and the concentration of tertiary amine in the charcoal is between 2 and 7%, based on the weight of the charcoal.

B 581,564

AMORPHOUS SILICON NITRIDE COMPOSITION CONTAINING CARBON, AND VAPOR PHASE PROCESS

Howard Wayne Jacobson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 28, 1975, Ser. No. 581,564
Int. Cl.² C04B *35/58;* **C23C** *11/14*
U.S. Cl. 106—47 R **9 Claims**

References Cited
UNITED STATES PATENTS

3,226,194	12/1965	Kuntz	423/344 X
3,352,637	11/1967	Heymer et al.	423/344 X
3,574,677	4/1971	Pammer et al.	427/94
3,637,423	1/1972	Sestrich	427/94 X
3,652,331	3/1972	Yamazaki	427/94

FOREIGN PATENTS OR APPLICATIONS

1,957,952	5/1971	Germany	427/94

1. An amorphous silicon nitride composition consisting essentially of from 95.0% to 99.9% by weight of amorphous silicon nitride, calculated as Si_3N_4 and based on the total weight of the composition, and from 0.1% to 5.0% by weight of carbon, calculated as elemental carbon and based on the total weight of the composition, the carbon being uniformly distributed within the silicon-nitrogen bonds in the amorphous silicon nitride.

4. Vapor phase process for preparing an amorphous silicon nitride composition according to claim 1 by the steps of (i) intimately contacting gaseous silicon tetrachloride ($SiCl_4$), gaseous ammonia (NH_3) and a gaseous hydrocarbon at a temperature from 1000°C. to 1500°C., hydrocarbon does not substantially decompose to form carbon prior to reaction of $SiCl_4$ and NH_3 to form silicons nitride (ii) condensing the products of the vapor phase reaction of step (i) and (iii) recovering the amorphous silicon nitride composition.

B 589,179

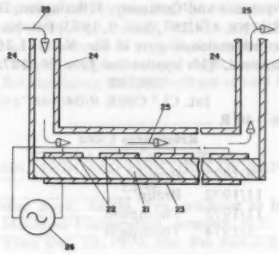
PROCESS FOR GENERATING PERIODIC NON-UNIFORM ELECTRIC FIELD, AND FOR REMOVING POLARIZABLE PARTICULATE MATERIAL FROM FLUID, USING FERROELECTRIC APPARATUS

Howard D. Batha, Tonawanda, N.Y., and Leslie E. Cross, State College, Pa., assignors to The Carborundum Company, Niagara Falls, N.Y.

Division of Ser. No. 348,835, April 6, 1973. This application June 23, 1975, Ser. No. 589,179
Int. Cl.² C25B *7/00;* **B01D** *13/02*
U.S. Cl. 204—186 **2 Claims**

References Cited
UNITED STATES PATENTS

2,555,487	6/1951	Haugaard et al.	204/180 R
3,304,251	2/1967	Walker et al.	204/186 X
3,478,494	11/1969	Lustenader et al.	55/127
3,496,701	2/1970	Owe Berg	55/6
3,687,834	8/1972	Candor	204/186



1. A process for generating a period non-uniform electric field, external to field-generating electrodes of the apparatus for generating the periodic non-uniform electric field, in an apparatus comprising

a. a ferroelectric material, polarizable in directions perpendicular to the surface of the ferroelectric material; the ferroelectric material comprising at least one portion, the direction of polarization of which is to be alternated during the generation of the periodic non-uniform electric field, and at least another portion, the direction of polarization of which is to remain the same during the generation of the periodic non-uniform electric field;

b. a plurality of electrodes, applied to opposite sides of the ferroelectric material, covering both sides of the portions of the ferroelectric material, the direction of polarization of which is to be alternated during the generation of the periodic non-uniform electric field, but leaving uncovered at least one side of the portions of the ferroelectric material so as to produce a non-uniform electric field, the direction of polarization of which is to remain the same during generation of the periodic non-uniform electric field, defining a location external to the field-generating electrodes and adjacent the boundary between the alternately polarized portions of the ferroelectric material, in which the periodic non-uniform electric field is to be generated; and

c. means for providing alternating potential to the electrodes

1. for alternating the direction of polarization of the covered portions of the ferroelectric material and leaving polarized in their original direction, the uncovered portions of the ferroelectric material;
2. for producing periodically alternately polarized portions of the ferrolectric material; and
3. for generating a periodic non-uniform electric field external to the field-generating electrodes, in the location adjacent the boundary between the alternately

polarized portions of the ferroelectric material, said process comprising providing alternating potential to the electrodes on the ferroelectric material in such a way

a. as to alternate the direction of polarization of the portions of the ferroelectric material, the direction of polarization of which is to be alternated, leaving polarized in their original direction the uncovered portions of the ferroelectric material, the direction of polarization of which is to remain the same;

b. as to produce thereby, periodically, alternately polarized portions of the ferroelectric material; and

c. as to generate thereby, a periodic non-uniform electric field, external to the field-generating electrodes, in the location adjacent the boundary between the alternately polarized portions of the ferroelectric material.

B 590,502

POLYMERIC FIBERS CONTAINING COLOR CONCENTRATES

Ram-Tirth Khanna, Linden Heath, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 414,287, Nov. 9, 1973, Pat. No. 3,905,937, which is a continuation-in-part of Ser. No. 241,253, April 5, 1972, abandoned. This application June 26, 1975, Ser. No. 590,502

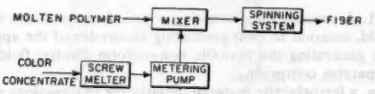
Int. Cl.[2] C08K 9/04

U.S. Cl. 260—40 R **9 Claims**

References Cited

UNITED STATES PATENTS

3,684,771	8/1972	Braun	260/37 R
3,704,255	11/1972	Braun	260/22 R
3,775,327	11/1973	Thompson	260/33.4 F
3,788,996	1/1974	Thompson	260/34.2



1. A polymeric fiber containing enough of a composition comprising, as essential components,

A. colorant, 1–80% by weight;

B. 1–25% by weight of a deflocculating agent of Class I through Class X; and

C. a polymeric carrier, not of Class I through Class X in (B), compatible with the fiber-forming polymer,

to provide 0.05–5%, by weight of the fiber, of colorant.

B 592,658

FAST DRYING INK

Victor Fu Hua Chu, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 537,597, Dec. 30, 1974, abandoned, and a continuation-in-part of Ser. No. 324,825, Jan. 18, 1973, abandoned. This application July 2, 1975, Ser. No. 592,658

Int. Cl.[2] C08K 5/11, 5/12

U.S. Cl. 260—31.8 N **19 Claims**

References Cited

UNITED STATES PATENTS

2,937,153	5/1960	Rasmussen	260/31.8 M
3,257,261	6/1966	Hochberg	260/31.8 M
3,471,428	10/1969	Hodgson	260/31.8 R
3,471,439	10/1969	Bixler	260/41
3,523,984	8/1970	Clas	260/31.8 R
3,644,267	2/1972	Jackson	260/31.8 M
3,684,771	8/1972	Braun	260/37 N
3,704,255	11/1972	Braun	260/404.8
3,775,327	11/1973	Thompson	260/33.4 F
3,788,996	1/1974	Thompson	260/34.2

FOREIGN PATENTS OR APPLICATIONS

767,376	11/1971	Belgium

OTHER PUBLICATIONS

Materials and Compounding Ingredients for Rubber, Bill Publications, New York, 1968, pp. 160, 178, 195, 204.

1. A liquid ink composition of low volatility consisting essentially of

A. a colorant;

B. as a film former, 15–40% by weight of the composition of a compound of classes II through X; and

C. a carrier having a vapor pressure of less than about 10 mm./Hg. at 20°C., and most of which will separate from the composition by migration into the substrate to which the composition is applied,

the film derived from the composition under normal use conditions having a melting point of no more than about +18°C. if crystalline or a glass transition temperature of no more than about −18°C. if non-crystalline.

ELECTRICAL APPLICATIONS

B 281,162

METAL SEMICONDUCTOR DIODE

Klaus Reindl, Sherman, Tex., assignor to Siemens Aktiengesellschaft, Munich and Berlin, Germany

Continuation of Ser. No. 95,048, Dec. 4, 1970, abandoned. This application Aug. 16, 1972, Ser. No. 281,162

Claims priority, application Germany, Dec. 15, 1969, 1962814

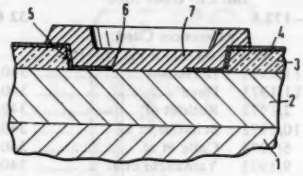
Int. Cl.² H01L *29/48*

U.S. Cl. 357—15 **2 Claims**

References Cited

UNITED STATES PATENTS

3,388,000	6/1968	Waters	117/212
3,405,329	10/1968	Loro	317/234
3,476,984	11/1969	Tibol	317/234
3,585,496	6/1971	Jager	317/234
3,597,667	8/1971	Horn	317/235
3,599,054	8/1971	Lepselter	317/234



1. A metal semiconductor diode with a silicon dioxide insulating layer, arranged on a semiconductor body and provided with a first contact window, a silicon nitride insulating layer which is thinner than the silicon dioxide insulating layer on said silicon dioxide insulating layer, said silicon nitride insulating layer having therein a second contact window which is 10 to 30 μm smaller than the first contact window, so that said silicon nitride insulating layer covers the edge of the surface of the semiconductor body which emerges through the first contact window and contact metal is provided in the first and in the second contact windows, said silicon dioxide layer being 0.4 to 0.8 μm thick and said silicon nitride layer being 100 – 500 A thick.

B 422,156

CONSTANT-VOLTAGE CONVERTER HAVING BEAM CURRENT DETECTOR

Noboru Yasumatsuya, and Mitsuo Isobe, both of c/o Matsushita Electric Industrial Company, Limited, No. 1006, Oaza Kadoma, Kadoma, Osaka, Japan

Continuation-in-part of Ser. No. 205,627, Dec. 7, 1971, abandoned. This application Dec. 6, 1973, Ser. No. 422,156

Claims priority, application Japan, Dec. 13, 1970, 45-110818

Int. Cl.² H01J *29/52*

U.S. Cl. 315—379 **8 Claims**

References Cited

UNITED STATES PATENTS

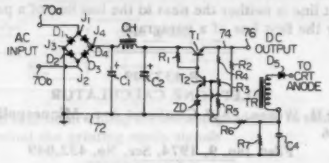
2,362,358	11/1944	Daly	315/411
3,517,301	6/1970	Huber	323/20
3,619,705	11/1971	Waybright	315/379

1. A power supply system for supplying a high voltage to an anode of a display tube and a relatively low voltage to deflection circuits of the display tube, which comprises:

rectifying means for rectifying an a.c. input into pulsating d.c.;

beam current detecting means for producing a beam current signal representative of intensity of the beam current of said display tube;

low voltage supplying means coupled to said rectifying means and responsive to the beam current signal of said detecting means for converting pulsating d.c. into a relatively low voltage and for supplying the low voltage to said deflection circuits of said display tube, while regulating the level of said low voltage in accordance with said beam current signal;



high voltage supplying means coupled to said low voltage supplying means for converting the relatively low voltage into a constant high voltage and for supplying the high voltage to said anode of said display tube; and

feedback means coupled to said high voltage supplying means for stabilizing the high voltage of said high voltage supplying means.

B 428,271

DETERMINATION AND PRINTOUT OF REFERENCE LINE

William Weller Boyd, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,271

Int. Cl.² G06F *3/12*

U.S. Cl. 340—172.5 **11 Claims**

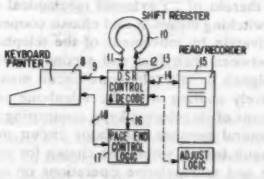
References Cited

UNITED STATES PATENTS

3,618,032	11/1971	Goldsberry et al.	340/172.5
3,706,075	12/1972	Fredrickson et al.	340/172.5
3,755,784	8/1973	Greek, Jr. et al.	340/172.5
3,764,986	10/1973	Spademan et al.	340/172.5
3,772,655	11/1973	Bluethman et al.	340/172.5

OTHER PUBLICATIONS

"Preparing Media for Unattended Printing"–IBM Technical Disclosure Bulletin–Vol. 14, No. 7, 12/71; p. 2105; W. F. Rogers.



1. In a word processing system usable by an operator for playout of previously stored control and textual codes to present a visual textual representation thereof for editing purposes, said system comprising:

means for storing said control and textual codes;

means for providing an operator readable output to said operator;

first logic means connected to said storing means for converting said control and textual codes into operator readable text lines;

means connected to said first logic means operable to allow said operator to enter a desired line count representing

the desired number of lines which will constitute a page of information; and

second logic means connecting said first logic means and said operator readable output means and connected to said line count means, said second logic means being operative to count text lines from the beginning of a page in said storing means and for gating a single particular text line to said output means, the line count of said single particular text line being approximately equal to said desired line count with the exceptions that said particular text line is neither the next to the last line of a paragraph nor the first line of a paragraph.

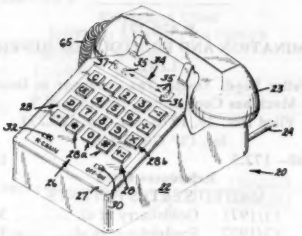
B 432,049
TELEPHONE CALCULATOR

Charles H. Wilson, 3317 Glenhurst Ave., Minneapolis, Minn. 55416

Filed Jan. 9, 1974, Ser. No. 432,049
Int. Cl.² H04M 1/50
U.S. Cl. 179—90 K **6 Claims**

References Cited
UNITED STATES PATENTS

3,725,907	4/1973	Boulanger	340/365 A
3,760,121	9/1973	Nissim	179/90 K
3,829,783	8/1974	Groenendaal et al.	328/14



1. The combination with a telephone having a desk-mountable telephone chassis defining a generally planar front panel; telephone circuit means in said chassis for performing normal telephone transmission and reception functions; a plurality of push-button telephone input selector keys arranged upon the front panel of the chassis, each normally disposed in a first position and being moveable to a second position upon application thereto of an external mechanical stimuli; telephone input switching means in said chassis cooperatively connected for activation by movement of the telephone input selector keys between their first and second positions for providing input signals to said telephone circuit means; of a calculator operatively sharing with the telephone only the activating movement of its selector keys, comprising:

a. general purpose calculator circuit means mounted on circuit boards within the chassis for performing arithmetic and manipulative operations on and in response to received digital information;

b. an electro-mechanical switching grid in said chassis having a plurality of switching members physically and operatively independent of the telephone circuit means and of the telephone input switching means, connected to directly supply said digital information to said calculator circuit means, said switching members being operative in conductive and in non-conductive modes for producing said digital information;

c. a plurality of push-button calculator actuator keys disposed across the front panel of the telephone chassis and including the plurality of telephone input selector keys, said calculator actuator keys being normally operable in a first position and being moveable to a second position upon receipt of an external mechanical stimuli;

d. means for mounting said switching grid in cooperative alignment with said calculator keys such that each of such calculator actuator keys moving between its said first and said second positions directly activates at least one of said switching members of said switching grid distinctly separate from activation of the telephone input switching means; and

e. visual display means mounted on the telephone chassis and operatively connected with said calculator circuit means for providing a visual numerical output display therefor.

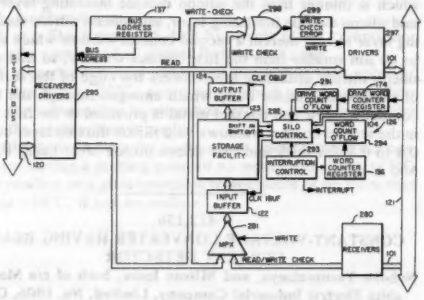
B 432,140
SECONDARY STORAGE FACILITY FOR DATA PROCESSING SYSTEMS

John V. Levy, Maynard; Steven R. Jenkins, Medford; Victor Ku, Westboro; Peter McLean, Stow, and Thomas N. Hastings, Arlington, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jan. 10, 1974, Ser. No. 432,140
Int. Cl.² G06F 3/00
U.S. Cl. 340—172.5 **32 Claims**

References Cited
UNITED STATES PATENTS

3,618,041	11/1971	Horikoshi	340/172.5
3,623,022	11/1971	Daye	340/172.5
3,643,223	2/1972	Ruth et al.	340/172.5
3,699,532	10/1972	Schaffer et al.	340/172.5
3,742,457	6/1973	Calle et al.	340/172.5
3,760,364	9/1973	Yamauchi et al.	340/172.5
3,766,526	10/1973	Buchanan	340/172.5
3,810,105	5/1974	England	340/172.5
3,828,325	8/1974	Stafford et al.	340/172.5



1. A secondary storage facility for a data processing system comprising:

A. a controller connected to the system including

i. control circuit means for generating address signals and for generating and receiving control signals and control information signals, and

ii. controller data transfer means for receiving or transmitting data and control signals,

B. a drive for storing digital data including

i. data storage means,

ii. drive control circuit means for receiving address signals and for receiving and generating control signals and control information signals to effect with said control circuit means in said controller an asynchronous transfer of the control information signals,

iii. drive data transfer means for storing data in or retrieving from said data storage means synchronously, said transfer means being coupled to said drive control circuit means to select said drive for a data transfer,

C. asynchronous bus means for interconnecting said control circuit means in said controller and said drive, said asyn-

chronous bus means including address, control and control information conductor means, and

D. synchronous bus means for interconnecting said controller and drive data transfer means, said synchronous bus means including control and data conductor means.

B 449,892

CARTRIDGE TAPE MACHINE CLEANER APPARATUS

Larry L. Thompson, 2012 N. Bell St., Kokomo, Ind. 46901

Filed Mar. 11, 1974, Ser. No. 449,892

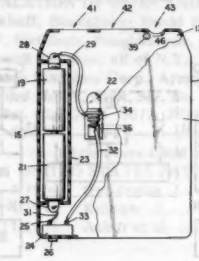
Int. Cl.² G11B 5/41

U.S. Cl. 360—137 8 Claims

References Cited

UNITED STATES PATENTS

3,439,922	4/1969	Howard	360/132
3,596,653	8/1968	Hotchkiss	240/2.18
3,647,990	3/1972	Eul, Jr., et al.	360/128



1. Apparatus for facilitating access to the tape-contacting and associated elements in a cartridge tape machine comprising a tape cartridge shell defining an open area in its rear portion and a first open area in its front portion and operable to be inserted in a cartridge tape machine, and illumination means attached to the shell for lighting the interior of the cartridge tape machine when the shell is inserted in the cartridge tape machine.

B 450,413

STATE DETECTION ARRANGEMENT FOR INK JET SYSTEM PRINTER

Isao Fujimoto, Kunitachi; Takeshi Kasubuchi, and Masahiko Aiba, both of Nara, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo and Sharp Kabushiki Kaisha, Osaka, both of, Japan

Filed Mar. 12, 1974, Ser. No. 450,413

Claims priority, application Japan, Mar. 12, 1973, 48-28688

Int. Cl.² G01D 18/00

U.S. Cl. 346—75 10 Claims

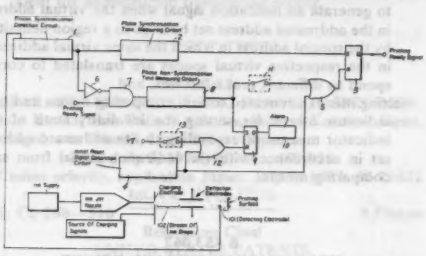
References Cited

UNITED STATES PATENTS

3,769,632	10/1973	Julisburger et al.	346/75

1. A state detection arrangement used for an ink jet system printer for making a record on a writing medium by means of ink drops charged by charging signals, said arrangement comprising means for generating phase OK signals when an ink drop separating rhythm is synchronized with the phase of the charging signals, means for determining whether the phase OK signals are generated in succession for a predetermined period of time initiated upon the occurrence of a first phase OK signal, and means responsive to said determining means for generating printing ready signals when the phase OK signals are successively generated for said predetermined period;

wherein the printing ready signal generating means comprises bistable switching means having input and output terminals which receives at said input terminal outputs



from said determining means and produces at said output terminal the printing ready signals.

B 452,138

SYSTEM FOR SWITCHING MULTIPLE VIRTUAL SPACES

Shigeo Nagashima, Hachioji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1974, Ser. No. 452,138

Claims priority, application Japan, Mar. 19, 1973, 48-30969

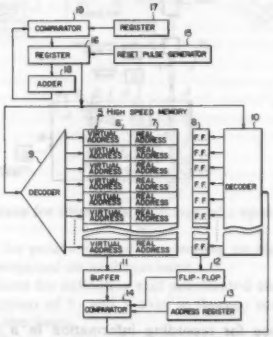
Int. Cl.² G06F 9/20

U.S. Cl. 340—172.5 6 Claims

References Cited

UNITED STATES PATENTS

3,585,606	6/1971	Evans et al.	340/172.5
3,764,996	10/1973	Ross	340/172.5
3,800,291	3/1974	Cocke et al.	340/172.5



1. In a virtual memory system having a real space and multiple virtual spaces used in a switching mode and comprising a high speed memory for storing a plurality of address sets each including a virtual address of said virtual space and a real address of said real space corresponding to the virtual address, indicator means provided in correspondence with respective address sets in said high speed memory for indicating one of the validity and invalidity states of the corresponding address sets and extracting means connected to said high speed memory for extracting the real address corresponding to the referred virtual address from said high speed memory;

a system for switching said virtual spaces including:

addressing means connected to said high speed memory for addressing in succession the address sets in said high speed memory;

first register means for storing at least one special address;

comparing means connected to said high speed memory and said first register means for comparing the virtual address

in the address set addressed by said addressing means with the special address in said first register means so as to generate an indication signal when the virtual address in the addressed address set belongs to a region delimited by the special address in which the same virtual addresses in the respective virtual spaces are translated to correspond to different real addresses; and

setting means connected to said comparing means and said indicator means for setting the invalidity state of the indicator means corresponding to the addressed address set in accordance with the indication signal from said comparing means.

B 453,067

HOLOGRAPHIC STORAGE DEVICE

Horst Kiemle, Ammerseestrasse 129, 8021 Neuried, Germany

Filed Mar. 20, 1974, Ser. No. 453,067

Claims priority, application Germany, Mar. 29, 1973, 2315776

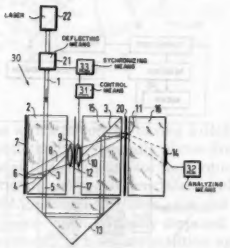
Int. Cl.² G11C *13/04*

U.S. Cl. 340—173 LM **10 Claims**

References Cited

UNITED STATES PATENTS

3,706,080	12/1972	Lee	340/173 LM
3,719,409	3/1973	Vincelette	340/173 LM
3,720,453	3/1973	Lee	340/173 LM
3,767,285	10/1973	Mezrich	340/173 LM
3,800,298	3/1974	Oguru	340/173 LM



1. A device for recording information in a holographic storage and for retrieving the information from the storage, comprising at least one transparent body having flat rectangular surfaces, a storage medium positioned adjacent a flat surface of said one body, a source providing a beam of coherent illumination directed through said one body onto the storage medium, means selectively deflecting the beam onto different portions of the storage medium; a retrodirective mirror positioned to receive the beam passing through the storage medium, an illumination hologram containing a plurality of sub-holograms positioned to be in the path of the beam from the retrodirective mirror, a detector matrix spaced from the storage medium, and a modulator matrix disposed adjacent a surface of said one body opposite said storage medium, said modulator matrix being associated with a condensing optical system for receiving an illuminating beam reconstructed by the redirected beam impinging on a sub-hologram of the illumination hologram and focusing an object beam created from the illuminating beam by the modulator matrix onto the storage medium to record a hologram thereon.

B 462,030

CIRCUIT ARRANGEMENT FOR COMMUNICATION FACILITIES WHEREIN TRANSMISSION PATHS CAN BE EMPLOYED FOR DIFFERENT TYPES OF MESSAGE SWITCHING

Franz Fahrenschon, Neuried; Horst Jäger, Munich; Hans Thinschmidt, Unterpfaffenhofen, and Alfred Meier, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 18, 1974, Ser. No. 462,030

Claims priority, application Germany, Apr. 19, 1973, 2320092

Int. Cl.² H04M *11/00*

U.S. Cl. 179—2 DP **4 Claims**

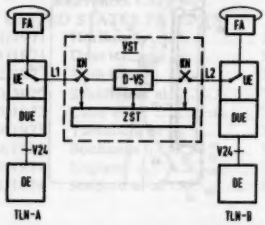
References Cited

UNITED STATES PATENTS

3,475,557	10/1969	Morse et al.	179/2 DP

FOREIGN PATENTS OR APPLICATIONS

1,206,639	9/1967	United Kingdom	179/2 DP
1,191,411	10/1963	Germany	179/2 DP
1,223,872	4/1961	Germany	179/2 DP



1. Apparatus for telecommunication systems having transmission paths capable of accommodating different types of message signals produced through using different modes of communication wherein connector sets for a plurality of modes of communication are connectable to a connecting path and having changeover means for switching from one mode of communication to another mode of communication in a given connecting path, said changeover means including a mode selector for selecting either manual or automatic switching from one mode of communication to another, comprising:

means in said connector sets for communicating a first switching signal to a called subscriber station for causing changeover to another mode of communication during automatic operation,

first changeover means in said called subscriber station for switching responsive to said first switching signal, said called subscriber station from one mode of communication to another, said called subscriber station being in an automatic switching mode,

means in said called subscriber station for evaluating said first switching signal and responsive to the changeover from one mode of communication to another for transmitting a first acknowledgement signal upon completion of said mode of communication changeover in said called subscriber station,

first means in said connector sets for monitoring said first acknowledgement signal and for communicating a second switching signal to the calling subscriber station for causing changeover from said one mode of communication to another,

second changeover means in said calling subscriber station for switching, responsive to said second switching signal, said calling subscriber station from said one mode of communication to another, said calling subscriber station being in an automatic switching mode,

means in said calling subscriber station for monitoring said second switching signal and for producing a second acknowledgement signal upon completion of a changeover from said one mode of communication to another,

second means in said connector sets for monitoring said second acknowledgement signal and producing an indication thereof and

inquiry means in said connector sets for signalling, responsive to the monitored presence of said first and second acknowledgement signals, the occurrence of changeover from said one mode of communication to another at said calling and said called subscriber stations as an inquiry to said calling and called subscriber stations for the acceptance of the desired message signals and for monitoring the continuence of the readiness of data terminal equipment in said calling and called subscriber stations.

B 484,482

RANDOM ACCESS DISK FILE WITH AXIAL TRANSLATION OF DISKS AND END PLATE

Earl D. Barkhuff, Staatsburg; David S. Borm, Red Hook; Bernard W. McGinnis, Poughkeepsie, and Bertel E. Rosenlund, Hopewell Junction, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed July 1, 1974, Ser. No. 484,482

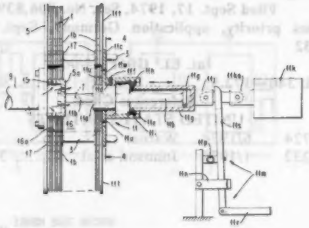
Int. Cl.[2] G11B *5/012, 23/02, 5/82*

U.S. Cl. 360—98 **28 Claims**

References Cited

UNITED STATES PATENTS

3,130,393	4/1964	Gutterman	360/98
3,509,553	4/1970	Krijnen	360/98
3,618,055	11/1971	Acker et al.	360/98



1. In a storage device:

a pair of parallel end plates rotating about a common axis; one of said plates slidably supported for reciprocating low friction displacements to said axis;

a stack of multiple storage disks supported between said plates for co-rotation about said axis and for low friction sliding displacements parallel to said axis; said disks and end plates surrounded by a fluid;

means linked directly to said one plate for reciprocally actuating said one plate for causing close and loose confinement of said disks;

means coordinated with said actuating means for forcing edges of said closely confined disks slightly apart at a selected interface in said stack to cause partial expansion of said selected interface, associated with causing a fluid pressure difference between the selected interface and the other interfaces; said partial expansion insufficient for unobstructed transducing access to said disks; and

means operable following said partial expansion for operating said actuating means to shift said one plate quickly to said position of loose confinement, whereby, due to cohesion and suction effects accompanying said shaft and due to said established pressure difference, the disks between said partially expanded interface and said one plate are shifted slidably with said one plate as a cohesive unit, thereby further expanding said selected interface sufficient for unobstructed transducing access.

B 485,926

APPARATUS FOR DISPLAYING IMAGE OF SPECIMEN

Kimio Kanda, and Tadashi Ohtaka, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed July 5, 1974, Ser. No. 485,926

Claims priority, application Japan, July 9, 1973, 48-76632

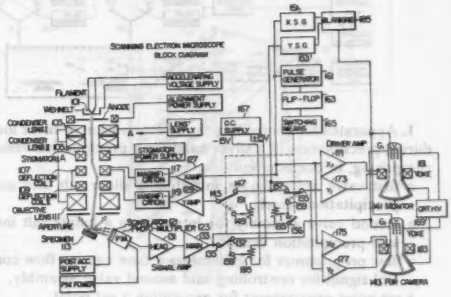
Int. Cl.[2] H01J *37/26*

U.S. Cl. 250—310 **9 Claims**

References Cited

UNITED STATES PATENTS

3,812,288	5/1974	Walsh	250/311



1. Apparatus for displaying an image of a speciment, comprising:

a. means for producing and accelerating an electron beam to be projected on said specimen,

b. first means for deflecting said accelerated electron beam in directions of X- and Y-axes to thereby scan a surface of said specimen,

c. means for converting information representative of states or properties of said specimen restulting from said electron beam bombardment of said specimen into corresponding electrical specimen information signals,

d. at least one cathode ray tube,

e. second means coupled with said cathode ray tube for deflecting an electron beam thereof in directions of X- and Y-axes,

f. brightness modulating means for producing an image of said specimen on a viewing face of said cathode ray tube in accordance with said electrical specimen information signals,

g. third means for producing an output in response to at least said X-axis second deflection means, and

h. fourth means responsive to said output from said third means for applying said electrical specimen information signals to said Y-axis second deflection means to thereby additionally produce on said viewing face of said cathode ray tube a wave form for aiding desired adjustments in the display of said image of said specimen.

B 504,156

FLOW CONTROL SYSTEM FOR THE PRECIPITATION OF SILVER HALIDE EMULSIONS

Keith Gordon Parthemore, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Sept. 9, 1974, Ser. No. 504,156

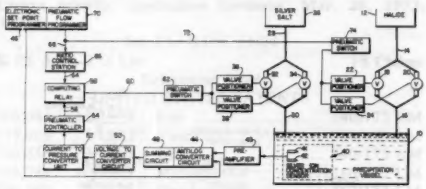
Int. Cl.² G01N *27/00;* **G06G** *7/57, 7/58*

U.S. Cl. 235—151.12 **2 Claims**

References Cited

UNITED STATES PATENTS

3,552,428	1/1971	Pemberton	235/151.34 X
3,610,898	10/1971	Yamamoto et al.	235/151.34
3,700,865	10/1972	Ley	235/151.34 X
3,739,636	6/1973	Versaci et al.	235/151.34 X
3,772,915	11/1973	Stamler	235/151.34 X
3,821,002	6/1974	Culhane et al.	23/230 A
3,854,038	10/1974	McKinley	235/151.34



1. Apparatus for controlling the concentration of silver ions during precipitation of a silver halide in a precipitation vessel comprising, in combination:

a first valve assembly for introducing silver salt into said precipitation vessel,

a second valve assembly for introducing a halide salt into said precipitation vessel,

a flow programmer for generating a time varying flow control signal for controlling said second valve assembly,

a set point programmer for generating a set point,

a sensor in said precipitation vessel for generating an analog signal representative of silver ion concentration therein,

linearizing means for linearizing said analog signal,

comparator means coupled to said linearizing means and to said set point programmer for generating a first error signal,

ratio means responsive to said flow control signal for modifying said flow control signal by a factor, and

adder means responsive to said first error signal and to said modified flow control signal for providing a second flow control signal for controlling said first valve assembly.

B 505,582

APPARATUS FOR SPINNING A MICROELECTRONIC SUBSTRATE

Vern D. Shipman, Dallas County, Tex., assignor to Headway Research, Inc., Garland, Tex.

Filed Sept. 12, 1974, Ser. No. 505,582

Int. Cl.² H02K *33/00*

U.S. Cl. 318—119 **12 Claims**

References Cited

UNITED STATES PATENTS

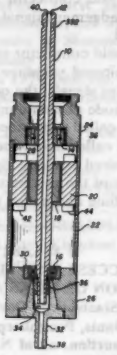
3,475,629	10/1969	Lagier	310/36

1. Apparatus for spinning a microelectronic substrate, comprising:

a base for receiving and holding said substrate,

a two-phase motor having a first winding and a second winding and including a rotor coupled to said base, and

a control circuit including means for initially applying a phase reversing, low frequency voltage to the second winding of said motor and a DC voltage to the first winding to generate a reversing magnetic field and impart an oscillatory motion to the rotor, said control circuit further including means for timing the oscillatory motion of the rotor and applying a high frequency running voltage to



the first and second windings to generate a revolving magnetic field to impart a rotating motion to said base.

B 506,839

ARRANGEMENT FOR REDUCING THE ACCESS TIME IN A STORAGE SYSTEM

Hans-Joerg Penzel, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sept. 17, 1974, Ser. No. 506,839

Claims priority, application Germany, Sept. 21, 1973, 2347632

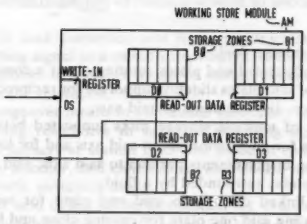
Int. Cl.² G06F *13/00*

U.S. Cl. 340—172.5 **3 Claims**

References Cited

UNITED STATES PATENTS

3,821,724	6/1974	Warner	340/173 R
3,863,232	1/1975	Johnson et al.	340/173 AM



1. An arrangement for reducing the access time in a storage system, which system comprises a working store including store modules, by intermediately storing a plurality of items of data read out from the working store, said arrangement comprising:

a plurality of storage zones in each of said store modules which can be read out independently of one another;

a plurality of read-out data registers each assigned to a respective storage zone; and

a common write-in register assigned to all storage zones of a store module.

B 506,840

PROCESS FOR TRANSMITTING SIGNALS BETWEEN TWO CHIPS WITH HIGH-SPEED COMPLEMENTARY MOS CIRCUITS

Karl Goser, Munich, and Michael Pomper, Schliersee, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sept. 17, 1974, Ser. No. 506,840

Claims priority, application Germany, Sept. 18, 1973, 2346966

Int. Cl.² H03K *17/60, 19/08*

U.S. Cl. 307—251 **10 Claims**

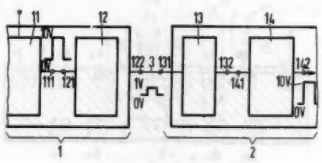
References Cited

UNITED STATES PATENTS

3,588,527	6/1971	Cricchi	307/221 C
3,590,273	6/1971	Jarvis	307/DIG. 1
3,673,438	6/1972	Lund	307/304 X
3,675,043	7/1972	Bell	307/DIG. 1
3,676,700	7/1972	Buchanan	307/DIG. 1
3,731,114	5/1973	Gehweiler	307/205
3,739,200	6/1973	D'Agostino	307/DIG. 1
3,801,831	4/1974	Dame	307/205
3,835,457	9/1974	Yu	307/DIG. 1

OTHER PUBLICATIONS

IBM Tech. Disc. Bulletin, Vol. 16, No. 5, 10/1973, "Low-Power Gated Receiver", by Chin et al.



1. A process for transmitting signals between first and second semiconductor chips each having high-speed complementary MOS circuits, comprising the steps of providing an output stage on the first chip for transforming the voltage level of a signal from a connected MOS circuit to a relatively low level voltage, providing a connection line for transmitting the relatively low level voltage to the second chip, whereby the connection line is connected with the output stage on the first chip, and providing an input stage on a second chip for amplifying the low level voltage to the original voltage level, whereby said input stage is connected with the connection line and the signal is restored to its original level for connection to a subsequent MOS circuit on the second chip.

B 508,639

MODULE FOR SUPPORTING CIRCUIT BOARDS

Karl Doerflinger, Zuericher Strasse 190, 8000 Munich 71; Hermann Renner, Baeckerstrasse 73, 8000 Munich 60, and Richard Theus, Stobaeusstrasse 62, 8190 Wolfratshausen, all of Germany

Filed Sept. 23, 1974, Ser. No. 508,639

Claims priority, application Germany, Sept. 27, 1972, 2348687

Int. Cl.² H05K *7/14*

U.S. Cl. 317—100 **5 Claims**

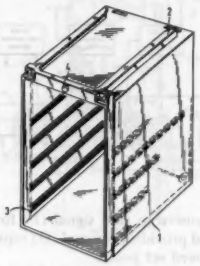
References Cited

UNITED STATES PATENTS

2,379,189	6/1945	Rupp	174/35 MS
3,177,407	4/1965	Paterson	317/101 DH
3,231,663	1/1966	Schwartz	174/35 MS
3,375,408	3/1968	Buhrendorf	317/101 CB
3,390,226	6/1968	Beyerlein	174/35 MS
3,733,523	5/1973	Reynolds	317/101 DH
3,858,091	12/1974	Wilkinson	317/120

FOREIGN PATENTS OR APPLICATIONS

2,014,806	10/1971	Germany



1. A module for supporting printed circuit boards therein comprising:

a top wall, a pair of side walls connected to said top wall, and a bottom wall connected to said side walls;

suspension means fixed to the outside surface of one of said walls for connecting said module into an assembly system;

support means mounted on the inside surface of said side walls for supporting printed circuit boards therein; and

said module comprising an integral one piece unit of synthetic material, said synthetic material being metallized and having graphite incorporated therein.

B 520,082

INTERACTIVE ROLL GAP-REVERSE ROLL SPEED CONTROL OF THE APPLICATOR OF A MATERIAL TREATER

Charles Robert Fay, and James Douglas Richter, both of Cincinnati, Ohio, assignors to Formica Corporation, Cincinnati, Ohio

Filed Nov. 1, 1974, Ser. No. 520,082

Int. Cl.² G06G *7/58*

U.S. Cl. 235—151.1 **10 Claims**

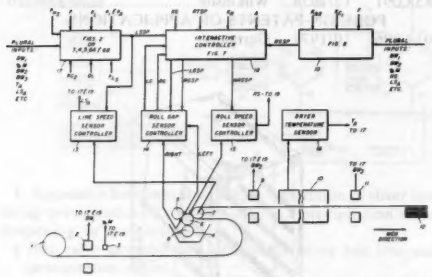
References Cited

UNITED STATES PATENTS

3,073,153	1/1963	Petitjean	73/73
3,260,642	7/1966	Canter, Jr.	162/252
3,378,676	4/1968	Clement	235/151.3
3,596,071	7/1971	Doering	235/151.35 X

6. In a fibrous host material treating process wherein said material is treated with a resinous solution in a reverse roll applicator and dried in a dryer, apparatus for controlling the application of said solution comprising

1. means for providing a signal (A) representative of the required line speed set point of said applicator,
2. means for providing a signal (B) representative of the desired roll speed set point of said applicator,
3. means responsive to said signal (A) and signal (B) for calculating the ratio of said desired roll speed set point to said required line speed set point and providing a signal (C) representative of said ratio,
4. means for providing a signal (D) representative of the desired set point of said ratio,
5. means responsive to said signal (C) and signal (D) for calculating the deviation of said signal (C) from said signal (D) and providing a signal (E) representative of said deviation,
6. means responsive to said signals (A), (B) and (E) for calculating the required change in the desired roll speed set point of said applicator and providing a signal (F) representative of said required change,



7. means responsive to said signal (F) for modifying said signal (B) and providing a signal (G) representative of the actual roll speed set point,
8. means responsive to said signal (G) for controlling the actual roll speed,
9. means responsive to said signal (F) for calculating the change required in the actual gap setting of said applicator to maintain the desired amount of resin application onto said host material and providing a signal (H) representative of said gap setting change required.
10. means for providing a signal (I) representative of the actual gap settings of said applicator roll,
11. means responsive to said signal (H) for modifying said signal (I) and providing a signal (J) representative of the new gap set point and
12. means responsive to said signal (J) for controlling said applicator roll gap settings.

B 520,115

SEMICONDUCTOR DEVICE WITH HIGH VOLTAGE BREAKDOWN RESISTANCE

Takeshi Matsushita, Sagamihara, and Hisao Hayashi, Atsugi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 351,172, April 17, 1973, abandoned. This application Nov. 1, 1974, Ser. No. 520,115
Claims priority, application Japan, Apr. 20, 1972, 47-39759
Int. Cl.[2] H01L *29/34*
U.S. Cl. 357—52 **12 Claims**

References Cited
UNITED STATES PATENTS

3,035,186	5/1962	Doucette	357/22
3,300,694	1/1967	Stehney et al.	357/20
3,335,296	8/1967	Smart	357/53
3,391,287	7/1968	Kao et al.	357/53
3,571,674	3/1971	Yu et al.	357/53
3,704,399	11/1972	Glaise	357/13

1. A semiconductor device comprising:

a planar substrate of semiconductor material of one conductivity type having first and second surfaces on opposite sides thereof;

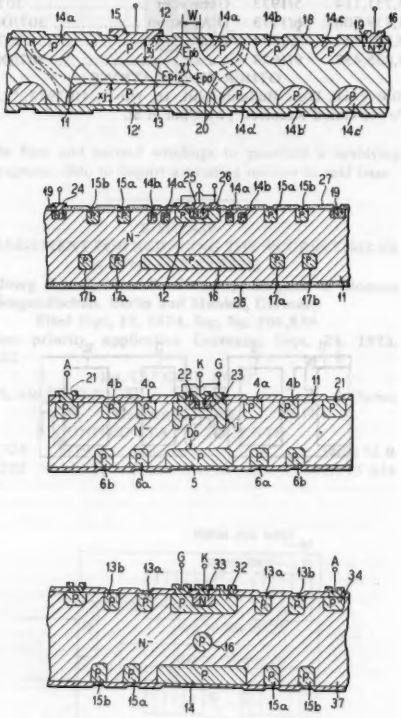
a first region of the opposite conductivity type on said first surface of said substrate forming a first pn junction therewith;

a first electrode mounted on said first region;

a second region of said opposite conductivity type on said first surface of said substrate forming a second pn junction therewith which surrounds said first pn junction in predetermined spaced relation;

a third region of said opposite conductivity type on the second surface of said substrate forming a third pn junction therewith which faces said first region in predetermined spaced relation therewith; the periphery of said third region extending beyond that of said first region;

said second and third regions being free of electrical connection;



a potential source reverse biasing said first pn junction with a potential of such magnitude such that the depletion layer will extend from said first pn junction to said second and third pn junctions;

a second electrode mounted on said substrate and disposed on a region of said one conductivity type on said first surface of said substrate, and the distance between said second electrode and said first region being larger than the distance between said first and second regions;

said potential source connected to said first and second electrodes;

said first, second and third regions being arranged so that a depletion layer extends from the vicinity of said first pn junction and surrounds said second and third regions so

as to increase the breakdown voltage, and insulating layers covering said first and second surfaces.

B 523,226

SOLID STATE ALTERNATING CURRENT SWITCHING DEVICE

Eduard Karl Ott, Bothell, Wash., assignor to Frontier Machinery Company, Walla Walla, Wash.

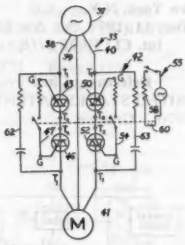
Filed Nov. 13, 1974, Ser. No. 523,226
Int. Cl.² H03K *17/60*
U.S. Cl. 307—252 B **7 Claims**

References Cited
UNITED STATES PATENTS

3,226,625	12/1965	Diebold	307/252 Q
3,421,063	1/1969	Reinke	307/252 B
3,543,051	11/1970	Potter	307/252 B

OTHER PUBLICATIONS

"Motor Start Switch", by Marckel, IBM Technical Discl. Bulletin, Vol. 14, No. 6, Nov. 1971, pp. 1942, 1943.
"Triac AC Contactor", by Farel et al., I.B.M. Tech. Discl. Bulletin, Vol. 13, No. 8, Jan. 1971, pp. 2277.



1. A solid state alternating current three phase power switching device for controlling a network between a three phase alternating current source having a predetermined peak voltage and a motor in which the network has a power line for each phase, comprising:

pairs of series directly connected triacs mounted in at least two of the three power lines;

each triac having a nonconducting state and a conducting state;

wherein each triac has an individual breakover voltage less than the source peak voltage;

wherein the sum of the breakover voltage of the triacs exceeds the source peak voltage;

each triac having a gate terminal;

isolated circuits interconnecting the gate terminals of each pair of triacs; and

each circuit having conductive means for permitting a triac gate current to be conducted through the circuit between the gate terminals to change the pair of triacs from their nonconductive states to their conducting states to apply the source alternating current to the motor.

B 523,952

SWING OUT LOAD COIL ASSEMBLY

Jesse Lee Moser, Highpoint; Robert Philmore Reavis, Jr., Statesville, and Melvin Andrew Soderstrom, Advance, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

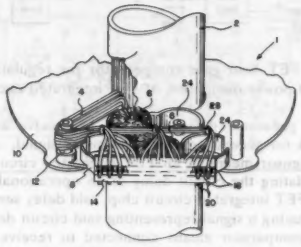
Filed Nov. 14, 1974, Ser. No. 523,952
Int. Cl.² H01F *15/02*
U.S. Cl. 336—65 **8 Claims**

References Cited
UNITED STATES PATENTS

2,079,697	5/1937	Ranges	336/192 X
3,134,854	5/1964	Martin, Jr. et al	336/68 X
3,526,712	9/1970	Drom	336/208 X
3,638,171	1/1972	Huibrechtse	339/256 R
3,760,335	9/1973	Roberts	339/99 R
3,824,530	7/1974	Roberts et al.	339/99 R
3,845,435	10/1974	Georgopiulos	178/46 X
3,865,980	2/1975	Moser et al.	178/46
T920,007	3/1974	Cator	336/208 X

FOREIGN PATENTS OR APPLICATIONS

477,749	10/1969	Switzerland	178/46



1. In combination with a multi-conductor cable element comprising a plurality of pairs of associated conductors, an improved loading coil assembly for connecting a coil to each of said pairs, said assembly having a plate-like member extending transverse to the local axis of said cable with said cable extending through an opening in the center of said plate-like member, and a coil tray mounted on said plate-like member, said coil tray having a bottom surface with a number of holes therein with upstanding walls extending from said bottom surface to form a number of separate cells, each cell being laterally displaced from said cable element and containing a loading coil, the improvements comprising:

an upstanding surface located on the periphery of said tray, said surface having a top side and a bottom side, the latter being adjacent to the bottom surface of said coil tray,

a plurality of side-by-side terminals located on said upstanding surface, each of said terminals having first and second spaced-apart wire receiving portions, adjacent to opposite ends thereof, all of said first wire receiving portions being identical and being located adjacent to the top side of said upstanding surface, and all of said second wire-receiving portions being identical and being located adjacent to the bottom side of said upstanding surface,

a plurality of conductors extending outward from said multi-conductor cable element, across the top of said cells, and across the top side of said upstanding surface, each of said conductors being affixed to one of said first wire-receiving portions of said terminals, and

coil wires extending from each of said coils through said holes in said bottom surface and across the bottom side of said upstanding surface, each of said conductors being affixed to one of said second wire receiving portions of said terminals at a point spaced from said coil, whereby all of the connections of said conductors and said coil wires to said terminals are accessible.

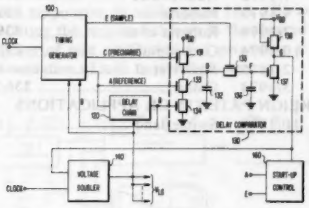
B 525,133
FET LOAD GATE COMPENSATOR

William M. Chu, and James M. Lee, both of Poughkeepsie, N.Y., assignors to IBM, Armonk, N.Y.

Filed Nov. 19, 1974, Ser. No. 525,133
Int. Cl.² H03K *1/12*
U.S. Cl. 307—262 **12 Claims**

References Cited
UNITED STATES PATENTS

2,883,536	4/1959	Salisbury et al.	328/155
3,206,686	9/1965	Goor	328/55 X



1. An FET load gate compensator for regulating circuit delay and power dissipation of FET integrated circuits, comprising:

timing generator means adapted to receive an external clock for generating a time reference signal,

delay sensor means in an FET integrated circuit chip for simulating the circuit delay of an operational circuit in the FET integrated circuit chip, said delay sensor means producing a signal representing said circuit delay,

delay comparator means connected to receive said time reference signal and said circuit delay signal for producing a control output signal which varies according to the equality or inequality of the time reference signal and the circuit delay signal, and

load gate voltage generating means connected to supply a load gate voltage to the FET integrated circuit chip and responsive to said control output signal to vary said load gate voltage to cause said circuit delay signal to be equal to said time reference signal.

B 526,654
MAGNETIC RELAY

Charles D. Flanagan, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 25, 1974, Ser. No. 526,654
Int. Cl.² H01H *45/00*
U.S. Cl. 335—186 **13 Claims**

References Cited
UNITED STATES PATENTS

1,971,199	8/1934	Owens	335/169
2,685,012	7/1954	Coulson	335/170
2,811,601	10/1957	Somers	335/170
3,864,650	2/1975	Evans	335/186
3,864,651	2/1975	Flanagan	335/186

1. A manually set magnetic interlock bypass relay comprising:

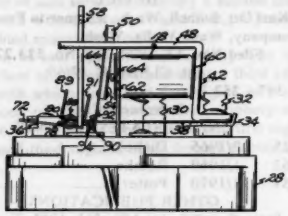
a. a base;

b. electrical interlock switch means mounted on said base operatively connectable in a load circuit;

c. electromotive force generating means including an electromagnetic coil operatively connected to the electrical interlock switch means for opening the load circuit upon energization of the coil;

d. bypass switch means mounted on said base connected in parallel with said electrical interlock switch means including a movable contact arm and a relatively stationary contact arm in overlaying relationship for movement in and out of electrical contact to close and open a circuit through the bypass switch means;

e. latch means operatively engageable with the movable contact arm of the bypass switch means for holding said movable arm in a first and second latched position inn contact with the stationary arm of the bypass switch means;



f. the electromotive force generating means also being operatively coupled to the latch means of the bypass switch means for moving the latch means from a first latched position to a second and then to an unlatched position; and

g. manually operable actuator means engageable with the movable contact arm of the bypass switch means for moving the movable arm into the first latch position.

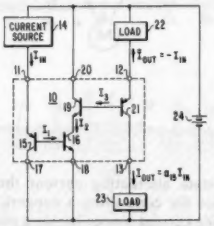
B 531,686
CURRENT AMPLIFIER

Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 11, 1974, Ser. No. 531,686
Int. Cl.² H03F *3/18*
U.S. Cl. 330—17 **5 Claims**

References Cited
UNITED STATES PATENTS

3,551,832	12/1970	Graeme	330/17



1. A current amplifier comprising:

first and second and third and fourth transistors, each having base and emitter and collector electrodes, said first and said fourth transistors being of a first conductivity type and having matched common-emitter forward current gain characteristics, said second and said third transistors being of a second conductivity type and having matched common-emitter forward-current gain characteristics, said first and said second conductivity types being complementary to each other, said first transistor base electrode being connected to said second transistor base electrode, said third transistor base electrode being connected to said fourth transistor base electrode;

supply means, with first and second terminals, for supplying an operating potential between its said first and said second terminals;

first direct current conductive means connected between said first transistor collector electrode and said first terminal of said supply means;

second direct current conductive means connected between said second transistor emitter electrode and said first terminal of said supply means;

third direct current conductive means connected between said second transistor collector electrode and said third transistor emitter electrode;

fourth direct current conductive means connected between said third transistor collector electrode and said second terminal of said supply means;

means exclusive of said fourth transistor connected to said first transistor emitter electrode for causing an input current flow therethrough;

a first path for direct current, connecting said fourth transistor collector electrode and said first terminal of said supply means;

a second path for direct current, connecting said fourth transistor emitter electrode and said second terminal of said supply means; and

first load means for receiving an output current responsive to said input current, said first load means being included in one of said first and said second paths for direct current.

B 532,326

SECOND-ORDER CANONICAL ACTIVE FILTER

Stalin A. Boctor, Agincourt, Canada, assignor to Northern Electric Company, Limited, Montreal, Canada

Filed Dec. 13, 1974, Ser. No. 532,326

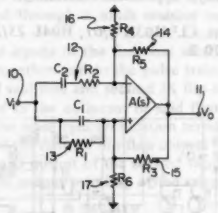
Int. Cl.² H03B *1/00*

U.S. Cl. 328—167 **6 Claims**

References Cited

UNITED STATES PATENTS

3,805,178	4/1974	Rollett	328/167
3,831,103	8/1974	Ruegg et al.	328/167
3,886,469	5/1975	Rollett	328/167



1. A second-order canonical active filter comprising:

input, output and common terminals;

a differential amplifier having inverting and noninverting inputs, and an output, the output of the differential amplifier being connected to said output terminal;

a first set of impedances including first and second impedance arms connected between said inverting and noninverting inputs respectively and said input terminal;

a second set of impedances including third and fourth impedance arms connected between said inverting and noninverting inputs respectively and said common terminal;

a third set of impedances including fifth and sixth impedance arms connected between said inverting and noninverting inputs respectively and said output terminal;

each of the impedance arms of one of said sets being complex resistive-capacitive impedances and the other impedance arms of the other two sets being resistive,

said impedances coacting with said differential amplifier to provide a notch filter.

B 534,915

GROUND FAULT AND NEUTRAL FAULT DETECTION CIRCUIT

Harold Allen Wittlinger, Pennington, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 368,662, June 11, 1973, abandoned. This application Dec. 20, 1974, Ser. No. 534,915

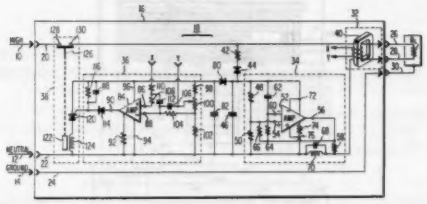
Int. Cl.² H02H *3/28*

U.S. Cl. 317—18 D **3 Claims**

References Cited

UNITED STATES PATENTS

3,611,035	10/1971	Douglas	317/18 D
3,638,072	1/1972	Kobayashi et al.	317/18 D
3,713,003	1/1973	Benham	317/18 D
3,732,463	5/1973	Dale	317/18 D
3,772,569	11/1973	Wible	317/18 D
3,800,189	3/1974	Montz	317/18 D



1. A circuit for detecting neutral faults and ground faults and for providing power interruption in response thereto, said circuit comprising:

first, second and third conductors respectively adapted for connection to the line bus, neutral bus and ground bus of an a.c. power distribution system;

a core of magnetically permeable material having a conductor wound about at least a portion of said core material, said first and second conductors being passed through said core;

a signal generating means for providing a signal at a particular frequency, said particular frequency being asynchronous with respect to the frequency of said a.c. power distribution system, said signal generating means comprising a differential amplifier configured as an oscillator and including means for deriving an operating potential for said differential amplifier from said first conductor;

means for resistively coupling the signal generated by said signal generating means onto said second conductor;

a signal detecting means having a pair of input terminals and an output terminal, said pair of input terminals being connected to the ends of said conductor wound on said core, said signal detecting means further comprising an operational transconductance amplifier and including means for deriving an operating potential for said operational transconductance amplifier from said first conductor; and

a line interrupter means connected between said signal detecting means output terminal and said first conductor for interrupting the flow of power through said first conductor in response to the signals generated in said core winding;

said core winding having signals induced therein in the event of a ground fault or a neutral fault in said power distribution system.

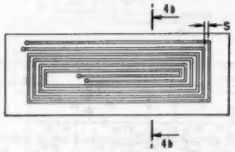
B 535,256
MINIATURIZED STRIP-LINE DIRECTIONAL COUPLER PACKAGE HAVING SPIRALLY WOUND COUPLING LINES

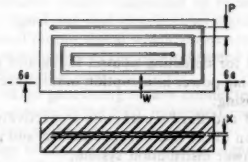
Edward S. Caragliano, Poughkeepsie, and Howard H. Nick, LaGrangeville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,256
Int. Cl.² H01P 5/18
U.S. Cl. 333—10 **9 Claims**

References Cited
UNITED STATES PATENTS

3,164,790	1/1965	Oh	333/10
3,407,366	10/1968	Dworkin	333/10 X
3,551,856	12/1970	Hoffman	333/10 X
3,629,738	12/1971	Senf	333/84 M X





1. A strip-line directional coupler having a smaller volumetric size without a consequent reduction in electrical operation comprising;

an input coupling line wound in a small pitch planar spiral;

an output coupling line wound in a planar spiral having the same pitch as the spiral of said input coupling line so that said input and output coupling lines can be located at a fixed distance which is sufficiently close to one another along their entire length to provide coupling of an input signal from the input coupling line to the output coupling line in the backward direction;

a first and second ground plane located one on either side of a small distance from said spirally wound input and output coupling lines;

a dielectric material located between said input and output lines and between said ground planes and said input and output lines;

the spirally wound input and output coupling lines having sufficiently small pitch to provide electro-magnetic coupling between adjacent windings of the spirals to obtain improved electrical characteristics so as to enable a reduction of spacing of said first and second ground planes from either side of said spirally wound input and output coupling lines thereby offsetting the improved electrical characteristics and, thereby further diminishing the volumetric size of said device into a small flat package.

B 557,274
ELECTRET TRANSDUCER

Jan Van Turnhout, Delft, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

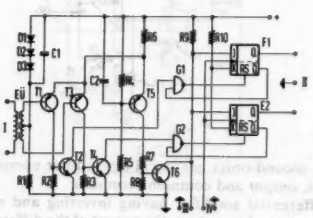
Filed Mar. 11, 1975, Ser. No. 557,274
Claims priority, application Netherlands, Mar. 15, 1974, 7403471
Int. Cl.² H04R 19/00; H01G 7/02
U.S. Cl. 179—111 E **4 Claims**

1. An electrostatic transducer comprising, at least two electrodes, which are disposed opposite each other, of which one electrode forms part of a vibratory diaphragm and of which the other electrode is fixed, a disc of electret material being disposed between the electrodes and at one of the electrodes, characterized in that the electret material comprises a copolymer of tetrafluoroethylene and perfluorine (alkylvinylether), in which the alkylgroup contains from 1 to 5 carbon atoms.

B 559,631
PCM REGENERATOR

Reginhard Pospischil, Lochham, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Mar. 19, 1975, Ser. No. 559,631
Claims priority, application Germany, Apr. 10, 1974, 2417644
Int. Cl.² H03K 5/01; H04L 25/20
U.S. Cl. 178—70 R **4 Claims**



1. A PCM regenerator for pseudoternary-coded signal pulses having an amplitude decision device,

a time decision device,

a pair of input terminals receiving the input pulses which have been corrected for cable attenuation and output terminals where the regenerated pulses which have been regenerated in amplitude and time may be obtained, comprising an input transformer which has a center tapped secondary winding and a primary winding which is connected to said input terminals of the regenerator,

a first pair of pnp transistors which form a push-pull circuit and with their bases, respectively, connected to opposite ends of said secondary winding,

a base voltage divider for the push-pull circuit connected to the center tap of said secondary winding,
a first capacitor connected in parallel with said voltage divider,
a second voltage divider formed of two resistors,
a third pnp-transistor with its base connected to said second voltage divider,
a second capacitor connected in parallel with one of said resistors, the emitter of said third transistor connected to the emitters of said first pair of transistors,
a third resistor connecting said emitters to a positive operating voltage,
a first npn transistor,
the collector of said third transistor connected to the base terminal of said first npn transistor through a fourth resistor,
the emitter of said first npn transistor connected to ground,
the base of said first npn transistor connected to ground through a fifth resistor,
the collector of said first npn transistor connected through a sixth resistor to said operating voltage,
second and third npn transistors with the base of each, respectively, connected to the collectors of said pair of pnp transistors,
the emitters of said second and third npn transistors connected to ground, and their bases connected through seventh and eighth resistors to ground,
first and second NAND gates,
the collector of said second npn transistor connected to the first input terminal of said first NAND gate,
the collector of said third npn transistor connected to the first input terminal of said second NAND gate,
first and second JK flip-flops,
the output of the first NAND gate connected to the resetting input of said first JK flip-flop,
the output of the second NAND gate connected to the resetting input of said second JK flip-flop,
the inverting output of said first JK flip-flop connected to a second input of said first NAND gate,
the inverting output of said second JK flip-flop connected to the second input of said second NAND gate,
the K inputs of the first and second JK flip-flops connected together and through a ninth resistor to the operating voltage,
the pulse train inputs of the first and second JK flip-flops connected together and to the pulse train supply,
the J inputs of said first and second JK flip-flops connected together and to the collector of said first npn transistor and to a pulse train synchronization terminal, and
the Q output of the first JK flip-flop connected to an output terminal, the Q output of the second flip-flop connected to the second output terminal of the regenerator.

B 563,419

ERROR LOGGING IN SEMICONDUCTOR STORAGE UNITS

Richard J. Petschauer, Edina, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 486,033, July 5, 1974, Pat. No. 3,906,200. This application Mar. 28, 1975, Ser. No. 563,419

Int. Cl.² G06F *11/12*; G11C *29/00*

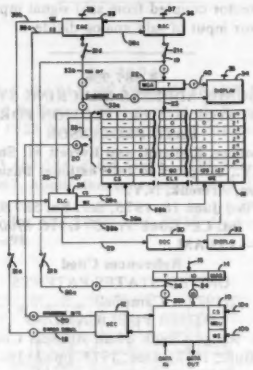
U.S. Cl. 235—153 AK **5 Claims**

References Cited

UNITED STATES PATENTS

3,350,690	10/1967	Rice	340/172.5
3,659,088	4/1972	Boisvert, Jr.	235/153 AC
3,704,363	11/1972	Salmassy	235/153 AK
3,735,105	5/1973	Maley	235/153 AC
3,803,560	4/1974	DeVoy et al.	235/153 AK
3,872,291	3/1975	Hunter	235/153 AK
3,893,071	7/1975	Bossen et al.	235/153 AM
3,898,443	8/1975	Smith	235/153 AM

1. In a procedure for scheduling preventative maintenance in a memory system that is configured into a plurality of bit planes and a plurality of bits per bit plane, each bit plane being a replaceable component that is replaced upon the detection of a defective bit therein, the method comprising:
arranging an error logging store to be comprised of a plurality of memory registers;
generating, upon the detection of a defective bit in each bit plane, an error word that is associated with the defective bit plane in which the defective bit is detected, said error word comprising a single tag bit;
testing the bit that is stored in the tag bit position of a memory register that is associated with the defective bit plane with which the generated error word is associated;
storing said generated error word in one of said memory registers of said error logging store only if said test indicates that a defective bit has not been previously detected in the associated one of said bit planes;
generating a defective device count only if said test indicates that a defective bit has not been previously detected in the associated one of said bit planes;



incrementing a defective device counter only upon the generation of each of said defective device counts;
monitoring said defective device counter until said monitored defective device count reaches a predetermined magnitude;
testing the bit that is stored in each of the tag bit positions of each of said memory registers;
reading out the error word that is stored in each of said memory registers only if said test indicates that an error word has been previously stored in the associated one of said memory registers;
monitoring said read out error words;
recording said read out error words and the associated defective bit plane;
providing preventative maintenance of said said memory system by replacing said defective bit planes with non-defective bit planes.

B 573,033

FAST AUTOMATIC GAIN CONTROL CIRCUIT WITH ADJUSTABLE RANGE

Eldon Marvin Sutphin, Jr., Merrimack, N.H., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,033

Int. Cl.² H03B *3/02*; G06G *7/16*

U.S. Cl. 328—168 **4 Claims**

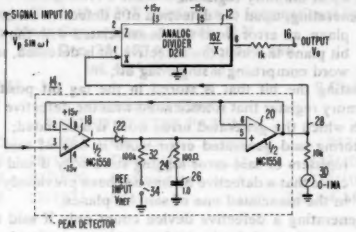
References Cited

UNITED STATES PATENTS

3,631,262	12/1971	Jarrett	328/161 X
3,654,424	4/1972	Vanderheist	328/161 X

1. An automatic gain control circuit having a signal input terminal and a signal output terminal, comprising
an analog divider having a numerator input coupled to said

signal input terminal, and having a quotient output coupled to said signal output terminal, and



a peak detector coupled from said signal input terminal to the divisor input of said analog divider.

B 587,936

UPPER BOUNDS ADDRESS CHECKING SYSTEM FOR PROVIDING STORAGE PROTECTION FOR A DIGITAL DATA PROCESSOR

David N. Gooding, Endicott, and Everett M. Shimp, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 18, 1975, Ser. No. 587,936

Int. Cl.² G06F *7/385*; G11C *8/00*

U.S. Cl. 235—153 AM **10 Claims**

References Cited

UNITED STATES PATENTS

3,639,912 2/1972 Campbell 340/172.5

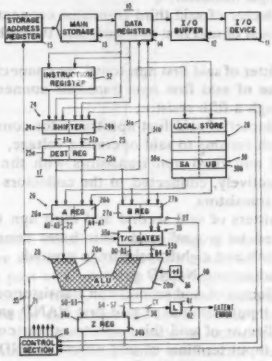
OTHER PUBLICATIONS

Enger, T. A. Range Check of an Address Counter, in IBM Tech. Disc. Bull., 16(7): Dec. 1973, pp. 2136–2137.

1. An upper bounds address checking system for checking a storage access request against an upper address limit and comprising:

parallel binary arithmetic circuitry having independent first and second arithmetic zones;

update circuitry for supplying both the current storage address and a requested storage access length value to the first arithmetic zone for producing a new storage address representing the upper extent of the storage access request;



and limit checking circuitry for supplying both the upper limit address and the new address produced by the first arithmetic zone to the second arithmetic zone for producing an indication of whether the new address exceeds the upper limit address.

REISSUES

MARCH 23, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,740

RACK AND PINION VARIABLE RATIO STEERING GEAR

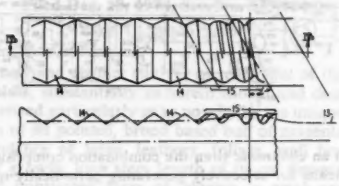
Arthur E. Bishop, 17 Burton St., Mosman, New South Wales, Australia

Original No. 3,753,378, dated Aug. 21, 1973, Ser. No. 171,842, Aug. 16, 1971. Application for reissue Oct. 24, 1974, Ser. No. 517,603

Claims priority, application Australia, Aug. 17, 1970, 2222/70; July 5, 1971, 3086/71

Int. Cl.² F16H *1/04*

U.S. Cl. 74—422 **17 Claims**



15. A variable ratio rack and pinion steering mechanism having an axially movable rack meshing with a helical pinion the axis of the which makes an angle with the axis of the rack, the rack being characterized by having groups of at least one tooth and of varying forms and varying inclinations with respect to the axis of the rack, the inclination of the teeth of at least one group being more closely aligned with the axis of the pinion, the inclination of teeth of said one group becoming less closely aligned with the pinion axis as they move away from the one group, the inclinations and forms of said group of teeth being associated with engagement of the said teeth with the pinion at varying effective pitch radii, the effective pitch radius being least at the position on the rack where the inclination is most closely aligned with the axis of the pinion and increasing to provide decreasing steering ratio with movement away from said one group.

Re. 28,741

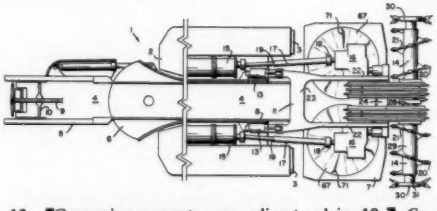
MINING MACHINE GATHERER WITH FENCE AND ARCUATE DISC VANES

Frank A. Delli-Gatti, Jr., Amity, Pa., assignor to Lee-Norse Company, Charleroi, Pa.

Original No. 3,817,579, dated June 18, 1974, Ser. No. 243,973, Apr. 14, 1972. Application for reissue Oct. 30, 1974, Ser. No. 519,266

Int. Cl.² B65G *65/06*; E21C *35/02*

U.S. Cl. 299—68 **13 Claims**



12. [Conveying apparatus according to claim 10,] *Conveying apparatus comprising conveyor means, gathering means operatively associated with said conveyor means for supplying material thereto, said gathering means comprising a plurality of counter-rotating discs and vanes on said discs, said vanes extending outwardly from adjacent the centers of their respective discs towards the peripheries thereof and having outer ends adjacent said peripheries, and said outer end of each vane trailing an inner portion thereof in the rotary direction of the rotation of the respective disc, and fence means extending from adjacent the center of each said discs towards a side of said conveyor means for cooperating with said vanes to guide material on said discs to said conveyor means, said vanes passing beneath said fence means during the rotation of said discs, and* wherein said vanes arcuately extend in the direction opposite to the rotary direction of their respective discs as they extend outwardly thereon.

Re. 28,742

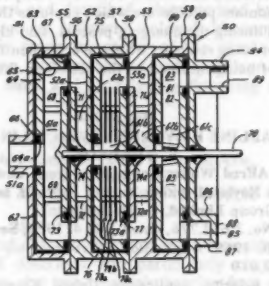
PUMPS CAPABLE OF USE AS HEART PUMPS

Edson Howard Rafferty, 419 Ontario St., S. E., and Harold D. Kletschka, 1925 Noble Drive, both of Minneapolis, Minn. 55414

Original No. 3,487,784, dated Jan. 6, 1970, Ser. No. 678,265, Oct. 26, 1967. Application for reissue Jan. 3, 1972, Ser. No. 215,221

Int. Cl.² F04D *1/14*; F01D *1/14*

U.S. Cl. 415—90 **6 Claims**



1. Pumping apparatus for use in pumping fluids susceptible to damage from turbulence and shock, comprising housing means having central fluid inlet means and peripheral fluid outlet means, rotator means disposed for rotation within said housing means and having surface means for accelerating fluid in substantially circular motion without said housing means as said fluid flows between said inlet means and said outlet means, means for sealing between said housing and rotator centrally about said inlet means and around the periphery of said rotator means, said inlet means including port means through said rotator means at the rotative axis thereof opening toward the periphery of said housing means, said surface means of said rotator means comprising plural parallel surfaces substantially each parallel to the planes of circular movement of said fluid passing through said housing means from said inlet means to said outlet means, said plural parallel surfaces being spaced at least one-fourth inch apart, said rotator means being adapted to rotate at a speed such that fluid passed thereto from said inlet means is caused to rotate circularly at substantially the speed of said rotator means, whereby turbulence and shock to said fluid in passing from said inlet means to said outlet means is avoided.

Re. 28,743

STORAGE BATTERIES CONTAINING ZINC HALIDE IN AN AQUEOUS SOLUTION OF THE TYPE HAVING A SOLUBLE CATHODE AND A DISSOLVED ANODE

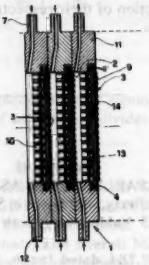
Mario De Rossi, Rome, Italy, assignor to Consiglio Nazionale Delle Ricerche, Rome, Italy

Original No. 3,738,870, dated June 12, 1973, Ser. No. 170,697, Aug. 11, 1971. Continuation-in-part of Ser. No. 856,408, Aug. 9, 1969, Pat. No. 3,625,764. Application for reissue Nov. 14, 1973, Ser. No. 415,499

Claims priority, application Italy, Apr. 23, 1969, 36614/69

Int. Cl.[2] H01M 4/38

U.S. Cl. 136—22 10 Claims



1. A reversible cell of the type which includes a zinc cathode, a chemically non-reactive electrode and an electrolyte comprising an aqueous solution of zinc bromide, the improvement in which the said electrode is in contact with said zinc bromide solution and with a conductive dispersion soaked in alkylammonium perchlorate which captures the bromine that is formed during the charging process, said electrolyte being capable of being removed from the cell when the cell is not in use and of being returned to the cell when the cell is in use.

Re. 28,744

CRYSTALLINE P-HYDROXYAMPICILLIN AND SALTS THEREOF

Anthony Alfred Walter Long, Handcross, and John Herbert Charles Nayler, Dorking, both of England, assignors to Beecham Group Limited, Great Britain

Original No. 3,674,776, dated July 4, 1972, Ser. No. 851,062, Aug. 18, 1969. Application for reissue July 23, 1973, Ser. No. 382,010

Claims priority, application United Kingdom, Aug. 23, 1968, 40319/68

Int. Cl.[2] C07D 499/44

U.S. Cl. 260—239.1 4 Claims

6. *Crystalline 6[(−)-α-amino-p-hydroxyphenylacetamido]-penicillanic acid trihydrate.*

Re. 28,745

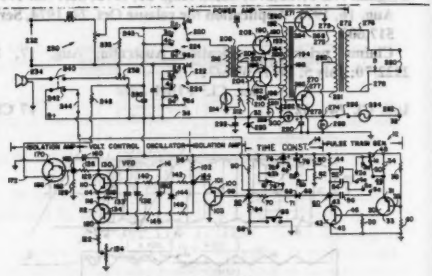
ELECTRONIC SIREN CIRCUIT

Gerald D. Smith, Indianapolis, Ind., assignor to Carson Manufacturing Company, Inc., Indianapolis, Ind.

Original No. 3,747,092, dated July 17, 1973, Ser. No. 205,624, Dec. 7, 1971. Application for reissue Apr. 24, 1975, Ser. No. 571,221

Int. Cl.[2] H04G 3/10

U.S. Cl. 340—384 E 24 Claims



1. In an electronic siren the combination comprising:

a. means for selectively generating periodically occurring charging pulses at one of a plurality of predetermined repetition rates,

b. time constant determining means coupled to said pulse generating means for generating a corresponding plurality of repeating voltage wave forms in response to said charging pulses,

c. means coupled to said wave form generating means for generating a square wave signal having a frequency proportional to the instantaneous voltage of said voltage wave form,

d. a power output amplifier circuit including

1. a first pair of [diffused base] transistors connected in a push-pull circuit configuration,

2. first circuit means selectively coupling said first pair of transistors to said square wave generator for driving said first transistors individually and alternately into saturation in response to said square wave signal,

3. a second pair of [diffused base] transistors connected in a push-pull emitter follower configuration, *said second pair of transistors being diffused base transistors,*

4. second circuit means coupling said second pair of transistors to said first pair of transistors for driving said second pair of transistors individually and alternately into saturation in synchronism with saturation of respective ones of said first pair of transistors, and

e. impedance matching means for coupling said second pair of transistors to a sound reproducing device.

PLANT PATENTS

GRANTED MARCH 23, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,846
ROSE PLANT

Reimer Kordes, Sparrieshoop, near Elmshorn in Holstein, Germany, assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Dec. 18, 1974, Ser. No. 533,804

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—27 1 Claim

1. A new and distinct cultivar of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its pointed, broad based bud of magenta-lilac, an abundance of large, leathery, foliage, well branched habit of growth, long stem length of its cut flowers, high centered imbricated form of blooms, a petal count of about 28, and strong fragrance.

3,847
ROSE PLANT

Herbert C. Swim, Ontario, and Arnold W. Ellis, Bakersfield, Calif., assignors to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Jan. 14, 1975, Ser. No. 540,856

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—11 1 Claim

1. A new variety of hybrid tea rose plant of the bush type and of moderate height, substantially as herein illustrated and described, which plant is further characterized by a plurality of the following features, taken in combination, namely, the tendency to produce blooms, usually one to a stem, ranging up to about 5½ inches in diameter and having up to about 45 petals and up to 15 petaloids, the bloom having a strong penetrating somewhat fruity fragrance and being especially characterized by the manner in which the basic creamy white color of its petals tends to be overlaid with shades of red and pink, which deepen on exposure to the sunlight, said plant further exhibiting little if any tendency either to set hips or produce seeds in the area of Southern California where it was propagated.

3,848
AFRICAN VIOLET NAMED HELGA

Arnold W. Fischer, Isernhagen, Germany, assignor to Geo. J. Ball, Inc., West Chicago, Ill.

Filed Mar. 27, 1975, Ser. No. 562,940

Int. Cl. A01h

U.S. Cl. Plt.—69 1 Claim

1. A new variety of African violet plant, substantially as herein shown and described, characterized by its profuse production of flower clusters borne on sturdy, upright stems growing compactly at the center of the plant and surrounded by abundant, relatively large leaves carried on strong, horizontally-spreading petioles whereby the flowers form a dense canopy at the center of the plant and above the spreading foliage.

3,849
AFRICAN VIOLET PLANT NAMED KARLA

Arnold W. Fischer, Isernhagen, Germany, assignor to Geo. J. Ball, Inc., West Chicago, Ill.

Filed Mar. 27, 1975, Ser. No. 562,941

Int. Cl. A01h

U.S. Cl. Plt.—69 1 Claim

1. A new variety of African violet plant, substantially as herein shown and described, characterized by its profuse production of uniquely colored blossoms which cluster to fully cover the center of the plant, its abundant dark green, horizontally spreading foliage, and vigorous growth habit and long lasting flowering cycle.

3,850
PLUM PLANT

Seishi Iwamura, 12430 E. South Ave., Parlier, Calif. 93648

Filed Apr. 14, 1975, Ser. No. 568,050

Int. Cl. A01h *5/03*

U.S. Cl. Plt.—38 1 Claim

1. A new and distinct variety of plum tree substantially illustrated and described and particularly characterized as being a large size tree regularly bearing fruit of exceptionally firm, uniform quality, thereby particularly suited for long distance shipping, and distinguished from the parent plant, which it most nearly resembles, Roysum (U.S. Pat. No. 2,619) by ripening three weeks earlier, the harvest date being September 5, with the last picking extendable for two weeks because of the high quality fruit.

PLANT PATENTS

PATENTS

GRANTED MARCH 23, 1976

ERRATA

For CLASS	See PATENT NO.
111–001	3,945,330
212–144	3,945,333
029–577	3,945,348
152–213	3,945,162
351–006	3,945,712
424–346	3,946,047
424–330	3,946,119
179–099	3,946,146

PATENTS

GRANTED MARCH 23, 1976

GENERAL AND MECHANICAL

3,945,041

PROTECTIVE DEVICE FOR A PERSON'S RIB CAGE AREA

Jhoon Goo Rhee, 2525 N. Ridgeview Road, Arlington, Va. 22207

Filed Feb. 28, 1975, Ser. No. 554,080
Int. Cl.² A41D *13/00*
U.S. Cl. 2—2 **8 Claims**

1. A protective device for use in athletic contests adapted to be worn around a person's waist for protecting the rib cage and adjacent areas comprising a generally rectangular flexible flat member having casing means with resilient foam means disposed therein, said member having contoured upper and lower edges and identical first and second end sections, said upper edge being contoured downwardly from each end section and then upwardly to define an upwardly extending midsection of said upper edge, said lower edge being contoured upwardly from each end section and then downwardly to define a downwardly extending midsection of said lower edge, vertically disposed holes in each of said end sections, a pair of horizontal holes disposed between said upper and lower edges adjacent said first end section vertical holes, fastening means in one of said horizontal holes, strap means disposed through said vertical holes in said end sections adapted to retain said device in a tubularly disposed shape with said end sections adjacent and separated, said strap means passing through said vertical holes and adapted to be movable through at least said first end section vertical holes, whereby when said device is being worn around a person's midsection a portion of said strap means between said first end section vertical holes can be pulled through one horizontal hole and into the second horizontal hole and fastened therein to thereby pull said adjacent end sections closer together and to thereby snugly secure said device around a person's waist.

3,945,042

PROTECTIVE GARMENT FOR SKATERS, AND THE LIKE

Alfred D. Lobo, 2655 Euclid Hts. Blvd., Cleveland Heights, Ohio 44106

Filed July 2, 1975, Ser. No. 592,614
Int. Cl.² A41D *13/00*
U.S. Cl. 2—2 **10 Claims**

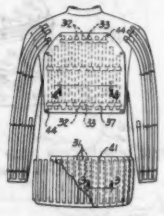
1. An outer garment for skaters and skiers worn primarily over the wearer's torso to reduce injury due to falls, comprising in combination:

an upper body portion to cover the upper body of the wearer from below the neck to just below the buttocks, said upper body portion being made of an yieldable fabric having essentially no cushioning property against impact;

said upper body portion including

a. arm portions, to cover the arms of the wearer, extending on either side of a neck opening, each arm portion carrying exteriorly thereupon plural elongated flexible cushioning members running from the shoulder to below the elbow in generally parallel spaced apart relationship;

b. a back portion to cover the back of the wearer, said back portion carrying exteriorly thereupon plural elongated cushioning members running in generally parallel spaced apart relationship; and



c. a seat portion to cover the buttocks of the wearer, said seat portion carrying exteriorly thereupon plural elongated cushioning members running vertically in generally parallel spaced apart relationship, and extending circumferentially to cover the trochanter region of each side;

said upper body portion being split down the front from the neck opening to near the bottom of the upper body portion; and

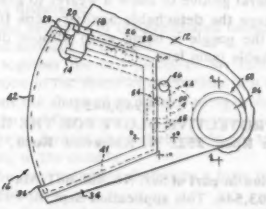
cooperating releasable fastening means to open and close the split.

3,945,043

FLIP-UP VISOR ASSEMBLY FOR HELMET

Armand DeAngelis, Southbridge, Mass., assignor to Omnitech Inc., Southbridge, Mass.

Filed Dec. 17, 1974, Ser. No. 533,705
Int. Cl.² A61F *9/06*
U.S. Cl. 2—8 **15 Claims**



1. A flip-up visor assembly for a helmet comprising:

a. a visor;

b. a resilient band formed with a generally centrally located fastener-receiving bore and with a pair of fastener-receiving slots elongated in the direction of the length of the band and located between the ends of the band and said bore;

c. means for securing said band across the brow portion of said helmet; and

d. means for mounting said visor on said band for pivotal movement between a lowered position at which the visor

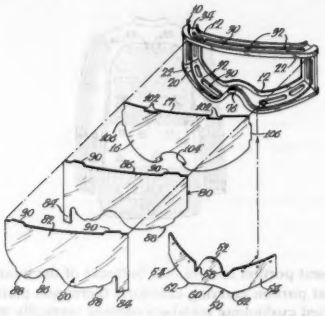
is in front of the upper portion of the wearer's face and a raised position clear of the wearer's face.

3,945,044

GOGGLE AND ACCESSORIES THEREFOR

Charles D. McGee, Ketchum, and Charles S. French, Sun Valley, both of Idaho, assignors to Scott USA, Sun Valley, Idaho

Filed Mar. 7, 1974, Ser. No. 449,096
Int. Cl.² A61F 9/02
U.S. Cl. 2—14 H **18 Claims**



7. A goggle comprising:

a detachable main lens having a first peripheral edge surface;

a detachable auxiliary lens having a second peripheral edge surface different in shape than the first peripheral edge surface and an extending tab;

a frame for maintaining the main lens in spaced relation to a wearer's face and the auxiliary lens abutting against the main lens until detached from the frame, including

a peripheral groove extending around the inner periphery of the frame, at least portions of the edge surfaces of the detachable main lens and the detachable auxiliary lens extending into the same peripheral groove by different amounts with the peripheral groove engaging to a greater extent the first peripheral edge surface

the tab of the auxiliary lens extending from the frame when the edge surface of the auxiliary lens is engaged by the peripheral groove to allow a wearer to grasp the tab and disengage the detachable auxiliary lens from the frame while the goggle is being worn without disengaging the detachable main lens.

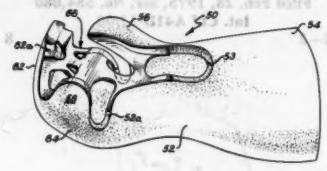
3,945,045

PROTECTIVE GLOVE FOR THE HAND

Jhoon Goo Rhee, 2525 N. Ridgeview Road, Arlington, Va. 22207

Continuation-in-part of Ser. No. 468,681, May 10, 1974, Pat. No. 3,903,546. This application Sept. 8, 1975, Ser. No. 611,424
Int. Cl.² A41D 13/10
U.S. Cl. 2—16 **6 Claims**

1. A flexible, unitarily molded, protective glove for wearing and use in the art of karate and the like, and adapted to cover the back and sides of the hand including the fingers and thumb and also adapted to cover the wrist and a portion of the arm, comprising a rear portion having an arm portion, a wrist portion, two side portions, a thumb portion, a front portion having a thickened portion, a finger portion, and retaining and securing means; said arm portion extending to a point below the elbow of the wearer and comprising generally cylindrical encircling means adapted to surround the arm; said wrist portion comprising encircling means adapted to partially surround the wrist and open at the inner wrist; said side portions extending upwardly from the respective sides of said front portion adapted to cover the sides of the hand; said thumb portion extending from the side of said wrist portion and adapted to cover the back of the thumb; said finger portion extending upwardly from the forward part of said front portion adapted to cover the backs of the fingers; said retaining means extending across the inner portion of said glove adapted to retain the glove on the wearer's hand; said securing



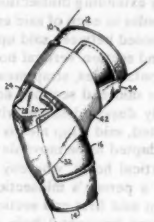
means disposed across each of said thumb and finger means adapted to secure the glove to the thumb and fingers of the wearer; said entire glove comprising resilient foam means covered with a tough surface casing; whereby said front portion and rear portions of the glove when worn on the hand are normally disposed in a finger extended position and whereby said front and rear portions are also capable of being folded together to form a fist.

3,945,046

FLEXIBLE KNEE SUPPORT

Lawrence Thompson Stromgren, 2917 Hillcrest, Hays, Kans. 67601

Filed Aug. 9, 1974, Ser. No. 496,158
Int. Cl.² A41D 13/06
U.S. Cl. 2—22 **7 Claims**



1. A knee support comprising:

a tubular, elastic sheath adapted to receive the leg of a wearer and to be positioned over the knee,

said sheath being of a length sufficient to cover the medial knee ligament complex when the sheath is positioned over the knee,

said sheath having upper and lower ends and opposed, inwardly and outwardly facing sidewall portions;

first and second elastic straps each having opposed ends;

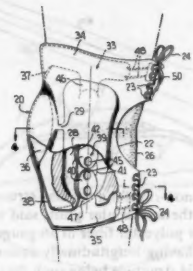
means anchoring one end of said first strap to said sheath adjacent the upper end thereof, and anchoring one end of said second strap to said sheath adjacent the lower end thereof; and

mating fasteners on the opposite ends of said straps and said sheath, said fasteners on the sheath being located adjacent said upper and lower ends of the sheath and mating with the fasteners on said second and first straps respectively,

said straps being drawn around the sheath into operative positions crossing each other on the inwardly facing sidewall portion of the sheath upon engagement of the mating fasteners and, in said positions, said first and second straps being adapted to pass under and over the knee

respectively, whereby to stabilize the knee without impairing normal flexibility.

3,945,047
KNEE PROTECTOR
Richard P. Jarrell, Jr., P.O. Box 2039, Tyler, Tex. 75701
Filed Dec. 19, 1974, Ser. No. 534,361
Int. Cl.² A41D *13/06*
U.S. Cl. 2—24 **7 Claims**



1. A knee protector comprising a body portion of rubber-like material of roughly tubular formation and adapted to be applied to the leg of a user substantially in surrounding relation to the knee joint, said body portion having an internal front fluid filled cushioning compartment and two side fluid-filled cushioning compartments adjacent the knee joint, said front compartment being disposed to overlie and cover the knee cap and the two side compartments being disposed to overlie and cover the two lateral sides of the knee joint, interconnecting flow passage means for fluid formed in the body portion communicating the front compartment with the two side compartments and the two side compartments with each other, whereby in response to impact against the protector adjacent one fluid compartment such compartment will be compressed and will force fluid therefrom through said flow passage means and into other compartments of the body portion; and relatively rigid mechanical bracing means comprising arcuate top and bottom leg embracing portions embedded in the material of the body portion above and below the cushioning compartments therein, and articulated side sections extending between and connecting said top and bottom portions formed of a plurality of hingedly connected plate members extending vertically through the side compartments of the body member, said plates being resistant to lateral bending and said hinged connections providing high flexibility in the normal direction of bending of the knee.

3,945,048
DISPOSABLE BIB AND METHOD FOR MAKING THE SAME
Janet Shearer, 10634 Atlanta Ave., Northridge, Calif. 91324
Filed Mar. 25, 1975, Ser. No. 561,947
Int. Cl.² A41B *13/10*
U.S. Cl. 2—49 R **15 Claims**

1. In a one piece disposable bib, a sheet having a lateral edge at an upper end of the bib and two longitudinal edges extending downwardly therefrom,

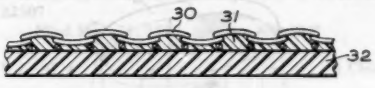
a neck opening adjacently spaced from said lateral edge and between said longitudinal edges,

the improvement comprising:

a pocket at a lower end of the sheet opposite said upper end,

said pocket being open toward said upper end and being V-shaped widthwise along its bottom.

3,945,049
PROTECTIVE GLOVES
Terence William Barlow, Marple, England, assignor to Barlow's Coated Fabrics Limited, Marple, England
Continuation-in-part of Ser. No. 282,564, Aug. 21, 1972, abandoned. This application Mar. 10, 1975, Ser. No. 556,646
Int. Cl.² A41D *19/02*; **B32B** *7/10, 31/18, 31/20*
U.S. Cl. 2—169 **5 Claims**



1. A process for the manufacture of gloves comprising:

a. pre-coating a light-weight textile fabric substrate on one side only with a dispersion consisting principally of nitrile-based polymer together with a proportion of polyvinyl chloride and soap, the dispersion being applied in a foamed condition and adhering to the outer surface of the fabric to fill its pores and interstices but not soaking completely through the fabric;

b. curing the dispersion;

c. superposing two plies of the pre-coated fabric with their pre-coated surfaces in contact;

d. welding together the two pieces of the fabric along a welding zone in the shape of the outline of a hand;

e. cutting out the shape thus defined using a shaped knife through the welding zone;

f. turning the so-formed glove-shell inside out to bring the pre-coating to the outside;

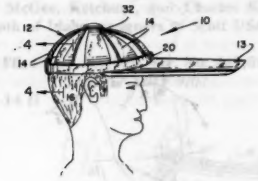
g. placing the inverted glove-shell onto a form in the shape of a hand; and

h. dipping the form and the pre-coated outer surface of the glove shell mounted on the form into a liquid plastics material to provide an impervious outer coating, such outer coating being prevented from striking through into the fabric due to the pre-coating of the fabric.

3,945,050
VISORED CAP
James J. Bohash, 20721 Millard St., Taylor, Mich. 48180
Filed Dec. 24, 1974, Ser. No. 536,245
Int. Cl.² A42B *1/02*
U.S. Cl. 2—197 **3 Claims**

1. A head covering comprising a body portion consisting of a plurality of spaced, spoked members, a head band encircling said body portion, said spoked members being fabricated of a

flexible material, said head band being double walled defining an annular slot, tabs being provided at the ends of said members and received in said slot to afford a horizontally slidable connection therein with said band.



3,945,051

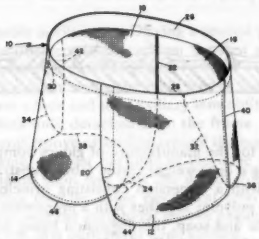
SHORT PANTS WITH PANEL OVERLAP

Eugene R. Burkard, 4534 West Pt. Loma Blvd., San Diego, Calif. 92107

Filed Nov. 4, 1974, Ser. No. 520,626

Int. Cl.² A41B 9/02

U.S. Cl. 2—224 R **5 Claims**



1. Short pants comprising:

left and right front panels of flexible fabric,

left and right seat panels of flexible fabric,

a waist encircling waistband,

said seat panels being joined together along a common edge in a vertical plane,

said front panels being joined together at least along their lower portions along a common edge in said vertical plane,

the lower portions of said front panels and said seat panels being secured together at their lower central extremities forming a crotch portion,

said seat panels being joined to said waistband along their upper edges over substantially more than half of the total circumference of said waistband with the front edge of said seat panels being secured to the front portion of said waistband,

the front edges of said seat panels extending downwardly and rearwardly from the front of said waistband,

said front panels being joined to said waistband along their upper edges along substantially the front half of said waistband and having rear edges that extend substantially beyond and overlie said front edges of said seat panels to form an overlap, and

said front panels being free of attachment to said seat panels over at least the lower portion of said overlap.

3,945,052

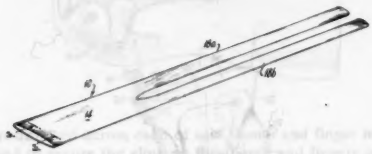
SYNTHETIC VASCULAR GRAFT AND METHOD FOR MANUFACTURING THE SAME

William J. Liebig, Franklin Lakes, N.J., assignor to Meadox Medicals, Inc., Oakland, N.J.

Continuation of Ser. No. 249,438, May 1, 1972, abandoned, which is a continuation of Ser. No. 865,326, Oct. 10, 1969, abandoned. This application Jan. 21, 1974, Ser. No. 435,131

Int. Cl.² A61F 1/00

U.S. Cl. 3—1 **2 Claims**



1. A warp knit, non-ravelling tubular structure suitable for forming into a synthetic vascular graft, said tubular structure being of fine denier polyester fiber in 56 gauge two-ply locknit construction, and having longitudinally extending ribs on the interior thereof, said structure being such that when converted into a synthetic vascular graft by known means, the porosity will be sufficient for optimum ingrowth of tissue while preventing hemorrhage when said synthetic vascular graft is implanted.

3,945,053

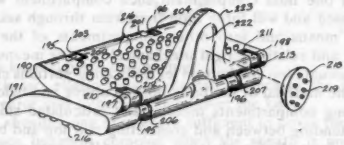
ROLLING CONTACT PROSTHETIC KNEE JOINT

Benny M. Hillberry, and Allen S. Hall, Jr., both of West Lafayette, Ind., assignors to Purdue Research Foundation, Lafayette, Ind.

Division of Ser. No. 337,868, March 5, 1973, Pat. No. 3,932,045. This application Oct. 15, 1974, Ser. No. 514,446

Int. Cl.² A61F 1/24

U.S. Cl. 3—1.911 **10 Claims**



8. A prosthetic joint, comprising: a first section having a first body member with a first external surface portion, said first section being adapted to be connected with a first predetermined bone structure; a second section having a second body member movable relative to said first body member, said second body member having a second external surface portion frictionally engaging said first external surface portion of said first body member to establish a non-slipping relationship therebetween during normal operation and said second section adapted to be connected with a second predetermined bone structure to form a joint between said predetermined bone structures; and flexible strapping means attached to said first and second body members to maintain said external surface portions of said body members in engagement with one another and constrained to rolling contact during said normal operation.

3,945,054

THROUGH CORNEAL PROSTHESIS AND METHOD OF INSTALLING SAME

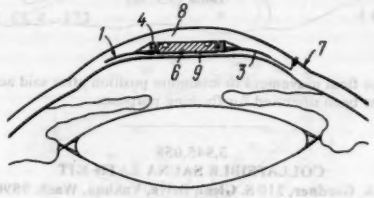
Svyatoslav Nikolaevich Fedorov, Novopeschannaya ulitsa, 2a, kv. 40, and Viktor Konstantinovich Zuev, Staroe shosse, 10, kv. 12, both of Moscow, U.S.S.R.

Continuation of Ser. No. 447,023, Feb. 28, 1974, abandoned. This application Dec. 2, 1974, Ser. No. 528,986

Claims priority, application U.S.S.R., Mar. 4, 1973, 1887763

Int. Cl.² A61F 1/16

U.S. Cl. 3—13 2 Claims



1. A through corneal prosthesis, comprising: a bearing member to be introduced between the layers of the cornea whereinto said prosthesis is installed; a bushing having a threaded hole rigidly mounted on said bearing member, the height of said bushing not exceeding the thickness of the cornea whereinto said prosthesis is installed; and a removable temporary threaded plug which is threadedly received into said hole of said bushing when said bearing member is being implanted, the height of said plug corresponding to the height of said bushing and not exceeding the thickness of the cornea whereinto the prosthesis is installed, said plug being adapted to be removed after said bearing member has been implanted and to be replaced by a removable threaded optical cylinder threadedly receivable into said hole of said bushing, said bearing member being formed as a ring having two frames which are diametrically arranged thereon so as to provide said bearing member with a generally rectangular overall shape.

3,945,055

TOILET FLUSHING RESERVOIR SYSTEM

Bennie L. Hollars, Orangevale, Calif., assignor to Arnold E. Hollars, Orangevale, Calif., a part interest

Filed Oct. 5, 1973, Ser. No. 404,047

Int. Cl.² E03D 3/04

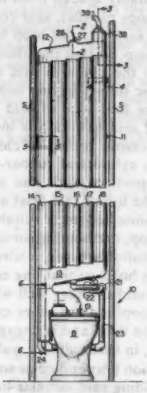
U.S. Cl. 4—30 9 Claims

1. In a toilet flushing reservoir system for use with a toilet bowl and a water inlet conduit,

a water reservoir including an upper tank-like header, a lower tank-like header, and a plurality of parallel, hollow, tubular members extending between said headers and providing fluid communication between the tank-like headers,

said upper header comprising inlet means for connecting said upper header to said water inlet conduit, a vent for connection to atmosphere, and a float valve for controlling said vent,

said lower header comprising outlet means for connection to said inlet toilet bowl, and a second outlet, control valve means for said outlet means, and



manually operable means connected with said second outlet for opening the outlet control valve means.

3,945,056

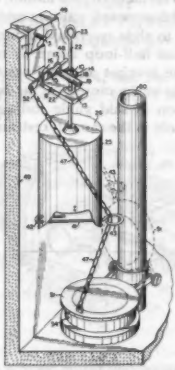
DUAL FLUSH TOILETS

Frank Kowalski, deceased, late of Alexandria, Va., by Helene Bober Kowalski, executrix, 7204 Regent Drive, Alexandria, Va. 22307

Filed Mar. 21, 1974, Ser. No. 453,362

Int. Cl.² E03D 1/30

U.S. Cl. 4—67 A 4 Claims



1. A conversion kit construction, for converting a flush tank toilet equipped with a flapper type outlet valve to a dual flush system, comprising,

a bracket fashioned for mounting and securing said kit inside said tank on the front wall of said tank, said bracket having a horizontal platform on which there is a vertical mount, said mount being provided with a hole through the vertical axis thereof, a recess in a lower side portion of said mount exposing said hole in said side of said mount, the surface of said mount opposite to the side having the recess being sloped from the top obliquely away from said vertical hole and and then vertically downward to the top of said platform of the bracket,

a control link, made of wire suitably bent, forming at one end a vertical rectangular loop with a second vertical circular loop, suitably spaced from the first and with the planes of said loops parallel, said control link extending from bottom of said circular loop to form a horizontal horseshoe half-loop, so that the plane of said half-loop is perpendicular to the plane of said circular loop, and a segment of elastic tubing having holes near its ends perpendicular to the long axis of said tubing, arranged so that, the wire of said half-loop is inserted in said holes, permitting said elastic tubing to close the open side of said half-loop. a cylindrical rubber-type float, having a hollow interior portion, with one end of said cylinder closed to form the top of said float and a hole in said top operationally connected to a suitable nut arrangement secured in said top, the bottom portion of the wall of said cylinder having suitable holes, a wire connector inserted into said suitable holes so that one end of said connector extends outside said cylinder wall where it forms a horizontal circular loop and the other end of said connector is bent back upon itself and is engaged in two holes, one above the other, in said cylinder wall, securing said connector in a position perpendicular to the long axis of said cylinder and holding said circular loop of the connector in a horizontal plane,

a guide rod of suitable length which, at its top, has a vertical circular loop and at its bottom end, is threaded,

so that for assembling said conversion kit, said threaded end of the guide rod is inserted through the space inclosed by said wire half-loop and said elastic tubing of the control link, with the said guide rod then slid through said vertical hole in the mount on the bracket and then said threaded end of the guide rod is screwed into the said top of the float,

permitting said guide rod attached to said float to slide vertically in said hole of the mount on the bracket and further permitting said control link to slide vertically on the upper portion of said guide rod, so that said half-loop and said elastic tubing of the control link may come to rest on the top surfaces of said mount, or said control link may be forced downward, causing said half-loop and said elastic tubing to slide over said mount until the bottom surfaces of said half-loop come to rest on top of said platform of the bracket and said elastic tubing is forced into said recess in the mount on the bracket, holding the exposed portion of said guide rod against the inside of said vertical hole in the mount, restraining said float from falling.

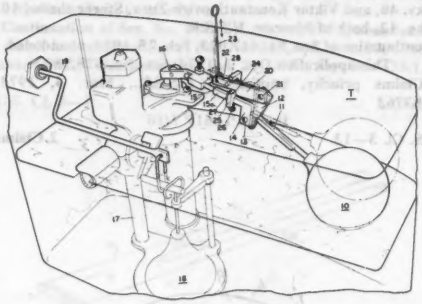
3,945,057

CONTROL FOR WATER CLOSETS

Louis J. Therkelsen, 28875 Georgia Road, Perrysburg, Ohio 43551

Filed Mar. 27, 1975, Ser. No. 563,176
Int. Cl.[2] E03D *1/34, 5/02;* **A61B** *19/00*
U.S. Cl. 4—67 R **5 Claims**

1. Control for water closets having a water tank containing a float-actuated valve for predetermining the volume of water admitted to the tank for flushing purposes, said control comprising an operative connection between the float and water valve including a mounting for the float enabling the same to rise selectively to minimum and maximum positions, a device for normally requiring the float to be disposed in such minimum position for admitting the smaller volume of water, a manual actuator for said device to move same to enable movement of the float to such maximum position for admitting the greater volume of water, and means to cause said device to



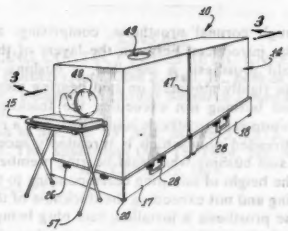
resume float movement to minimum position after said actuator has been operated for flushing purposes.

3,945,058

COLLAPSIBLE SAUNA BATH KIT

Kent A. Gardner, 210 S. Glenn Drive, Yakima, Wash. 98902

Filed Dec. 17, 1974, Ser. No. 533,718
Int. Cl.[2] A61H *33/06*
U.S. Cl. 4—163 **2 Claims**



1. A collapsible sauna bath kit comprising:

a foldable travelling case made in two half parts comprising water-tight, water-collecting rectangular trays, a conjunctive pair of edges of said parts being hingedly joined and covered with a water-tight seal, said half parts, when opened, lying outwardly flat against the floor, facing upwardly in tandem relation;

a foldable cot which, when folded, fits downward neatly into one of said open case half parts to be entirely confined therein and which when opened, provides a horizontal body-supporting covered-frame approximately co-extensive lengthwise with and spaced upwardly from and in parallelism with said opened travelling case, and suitable pairs of legs extending downward from said cot frame into both said half parts of said opened case;

a foldable tent frame which, when folded, fits downwardly neatly into the other of said open case half parts to be entirely confined therein, and which when opened, provides a horizontal tent cover supporting frame approximately co-extensive lengthwise with said opened travelling case, and having suitable pairs of legs extending downwardly from said tent frame outside of said cot frame and into both said half parts of said opened case;

a tent overlying said tent frame and having side and end walls hanging downward outside of said legs and inside of the side and end walls of said case half parts;

there being an opening in one of the tent end walls through which a patron may extend his head and neck while reclining on said cot;

foldable means for supporting the patron's head while extended through said opening; and

means for introducing water vapor into said tent to produce a sauna bath for said patron,

there being also space available in said case half parts for confining therein said tent, when folded, said head support means, when folded, and said vapor introducing means.

3,945,059

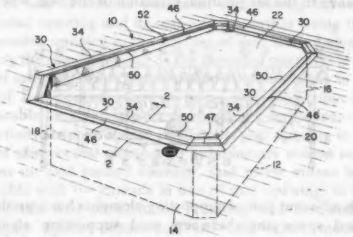
SWIMMING POOL WATER HEATING SYSTEM

Andrew Allocco, Jr., Miami Lakes, Fla., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Aug. 9, 1974, Ser. No. 496,007

Int. Cl.² E04H 3/16

U.S. Cl. 4—172 **4 Claims**



1. A pool water heating device for heating the water in a pool from solar heat from the Sun, and wherein said pool is constructed with border panel coping means in the path of rays from the Sun, and having a hollow area formed under the coping means, said heating device comprising water conducting piping means extending into said hollow area, coupling means for conducting water from said pool into and through said piping means, heat receiving and transfer means disposed within said hollow area for conducting heat to said piping means for heating said water flowing therein, water circulating means for circulating said water from said pool through said piping means and back into said pool, said border panel coping means comprising border platform means forming a border around the edges of said pool and formed with a substantial surface area capable of direct exposure to the rays of the Sun for being heated thereby, said heat receiving and transfer means extending outwardly laterally of said piping means and in heat exchange contact with said piping means and said heat receiving and transfer means having the outer edges thereof extending outwardly to and in heat receiving heat exchange contact with said coping means for receiving heat therefrom for conducting said heat to said piping means for heating said water circulating therein and for removing heat from said coping means.

3,945,060

LIQUID DISPENSING BOTTLE-HANGER CONSTRUCTION

Frank V. Gargione, Egg Harbor, N.J., assignor to The Climalene Company, Canton, Ohio

Filed Oct. 3, 1974, Ser. No. 511,780

Int. Cl.² E03D 9/03

U.S. Cl. 4—228 **13 Claims**

1. Combination bottle-hanging clip construction for hanging a bottle in inverted position including a bottle having at least side and bottom walls, said side wall being generally elliptically cylindrically shaped with a longitudinal axis, and having major and minor axes in transverse cross section; the lower portion of the bottle side wall is tapered inwardly and is jointed integrally with the bottle bottom wall; and the bottom wall is elliptically shaped having major and monor axes corresponding with and smaller than the respective major and minor axes of the bottle side wall; said bottom having boss means formed thereon; clip means having L-shaped leg means, said clip means having means engaging said boss means and being rotatably mounted on said bass means on the bottom wall for movement between stored and hanging positions; one leg of the clip means extending along the major axis of the bottom wall closely adjacent to the bottle bottom wall

when in stored position, and the other leg of said clip means is positioned radially inwardly of a vertical plane which is parallel to the longitudinal axis of the bottle and tangent to the outermost portion of the bottle side wall when the clip means is in said stored position; and the clip means being rotated 90° from stored position to hanging position, wherein said one leg of said clip means extends along the minor axis of the bottom wall, and said other leg extends generally parallel to said longitudinal axis and is spaced laterally from the side wall whereby the combined legs form a channel with the side wall for hanging the bottle in an inverted position.

3,945,061

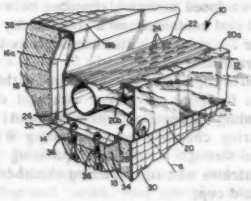
SWIMMING POOL INLET FITTING ASSEMBLY

George R. Whitten, Jr., 11 Highland Ave., Bellingham, Mass. 02019

Filed Dec. 13, 1974, Ser. No. 532,494

Int. Cl.² E04H 3/16, 3/18; F16L 21/02

U.S. Cl. 4—172.17 **9 Claims**



1. For use with a drain gutter and water supply assembly of the type which is adapted to be positioned along the periphery of a swimming pool, with an inner gutter wall over which contaminated water is received into the gutter from the surface of the pool, and with a filtered water supply manifold contained in the gutter, the improvement comprising: an inlet fitting assembly for directing filtered water from said supply manifold through said gutter wall into said pool, said assembly including a flanged male member adapted to extend through an opening in said wall, a flanged female member slidably received on said male member and adapted to cooperate therewith in holding said gutter wall therebetween, a locking member threaded onto said male member and engageable with said female member for urging said male and female members into the aforesaid cooperative relationship, and a

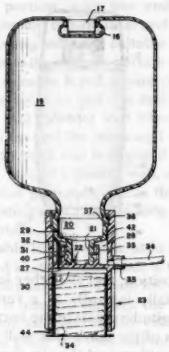
conduit member connected at opposite ends respectively to said supply manifold and said male member.

3,945,062

TOILET CHEMICAL DISPENSER

Douglas F. Corsette, 6559 Firebrand St., Los Angeles, Calif. 90045

Filed Jan. 24, 1975, Ser. No. 543,950
Int. Cl.² E03D 9/02
U.S. Cl. 4—227 6 Claims



1. A liquid product dispenser for use in a conventional flush tank and automatically operable by rise and fall of water within said tank between predetermined minimum and maximum levels, comprising in combination:

a liquid container having a generally cylindrical neck terminating in a discharge spout defining the mouth of said container;

means for supporting the container in inverted position in a flush tank;

a dispensing closure for said container comprising an open ended sleeve having an upper end sealingly associated with and axially adjustable on said container neck and a lower end adapted to extend into said water in the tank;

a partition within said sleeve between its ends dividing same into an enclosed metering chamber between said partition and said container and a downwardly opening pump chamber for communication through its lower end with the water in said tank;

a flow control cup carried by said sleeve within the metering chamber for axial movement with said sleeve into and from sealing engagement with said spout;

said metering chamber communicating with said pump chamber through a pressure equalizing passage which communicates with the metering chamber at a first level above said cup;

there being a discharge conduit communicating with said metering chamber at a second level below said first level and at a location outside of said cup.

3,945,063

BED AND STRETCHER FOR AN INVALID

Takashi Matsuura, Tokyo, Japan, assignor to Takashi Matsuura; Tamotsu Saito and Tetsuo Sato, all of Tokyo, Japan

Filed Dec. 9, 1974, Ser. No. 530,602
Claims priority, application Japan, Dec. 15, 1973, 48-141534
Int. Cl.² A47C 3/32
U.S. Cl. 5—63 8 Claims

1. A bed for an invalid, comprising:

a main frame;

first means fixed with respect to said main frame and defining a first, substantially horizontal, upwardly facing support surface for supporting an invalid thereon;

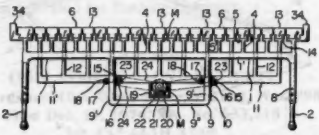
said first means including a plurality of elongated support members disposed in parallel relationship, said support members extending transversely across the bed and being uniformly spaced apart by a preselected distance in the longitudinal direction of the bed, whereby each adjacent pair of support members has a preselected space therebetween;

each of said support members having an upper surface area which defines a part of said first support surface;

a travelling frame movably supported on said main frame for vertical movement relative thereto;

second means mounted on said travelling frame and defining a second, substantially horizontal, upwardly facing support surface;

said second means including a plurality of elongated supporting elements disposed in parallel relationship, said supporting elements extending transversely across the bed and being uniformly spaced apart by a predetermined distance in the longitudinal direction of the bed, whereby



each adjacent pair of supporting elements has a predetermined space therebetween, said supporting elements being vertically aligned with and adapted to fit within the preselected spaces formed between the adjacent support members, and the centerline-to-centerline spacing between adjacent supporting elements being substantially equal to the centerline-to-centerline spacing between adjacent support members;

each of said supporting elements having an upper surface area which defines a part of said second support surface; and

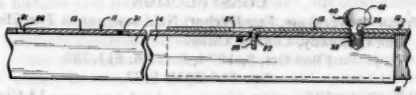
drive means connected to said travelling frame for vertically moving same between a first position wherein the supporting elements are disposed within the preselected spaces defined between the adjacent support members so that the upper surface areas of the supporting elements and support members define a common horizontal support surface for an invalid, and a second position wherein the support members and supporting elements are vertically spaced apart so that only one of said first and second support surfaces is usable as an invalid supporting surface.

3,945,064

ADJUSTABLE BED FRAME CONSTRUCTION

Allan E. Harris, and George M. Harris, both of Chicago, Ill., assignors to Harris-Hub Company, Inc., Harvey, Ill.

Filed Apr. 4, 1975, Ser. No. 564,098
Int. Cl.² A47C 19/00
U.S. Cl. 5—181 4 Claims



1. A bed frame member adapted to extend transversely between a pair of further bed frame members positioned in spaced parallel relationship, and be retained in one of a plurality of selected positions, comprising: a first elongated element

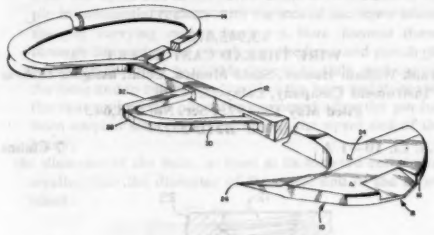
having first means adjacent one end for fastening said first element to one of said further bed frame members, said first element including first and second generally perpendicular flat legs; a second elongated element having second means adjacent one end for fastening said second element to the other of said pair or further bed frame members and including first and second generally perpendicular flat legs; a plurality of longitudinally spaced apertures in one of said first legs, each aperture corresponding to one of said selectable positions; a protrusion on the other of said first legs and engageable within one of said apertures for retaining said elements against longitudinal movement in both directions relative to one another when like legs of said first and second elements are positioned in surface-to-surface adjacency with respect to one another; and cooperating locking means for retaining said elements against separation when a position has been selected and the legs of said elements are positioned in surface-to-surface adjacency with respect to one another, said locking means including a plurality of longitudinally spaced threaded openings in said first leg of said first element, each opening being associated with one of said apertures and corresponding to one of said selectable positions, the spacing between each threaded opening and its respective aperture being the same, a threaded opening in the first leg of said second element and having the same diameter as the threaded openings in said first leg of said first element, the thread in said opening in said first leg of said second element being partially stripped, and a releasable locking member comprising a screw means having a partially stripped thread received in said opening in said first leg of said second element to permanently mount said screw means on said second element, said screw means being engageable with the threads in one of said openings in said first leg of said first element for retaining said first and second elements against separation, and said screw means being spaced from said protrusion by a distance equal to the spacing between each threaded opening and its respective aperture.

3,945,065

LUMBERING TOOL

Victor A. Dushku, Borden Studenstaden No. 2, 75233 Uppsala, Sweden

Filed June 30, 1975, Ser. No. 591,412
Int. Cl.² B25F *1/00*; B66F *15/00*
U.S. Cl. 7—14.3 **9 Claims**



1. A unitary portable, multi-function lumbering tool comprising:

an elongated shaft;

a head integrally disposed on one end of said shaft and having a wedge-shaped cross section tapering longitudinally from said shaft to a leading edge to facilitate its insertion into a saw track of a partially cut tree and to prevent a saw from binding therein, said head including a flared section extending in the plane of said head in a direction transverse to said shaft to provide a larger bearing surface for the head against a tree trunk;

at least one pointed edge projecting from a portion of said leading edge of said head for biting into a tree;

one or more rearwardly facing barbs disposed on one surface of said head for preventing said head from being pressed out of said saw track under the weight of the tree;

a handle integrally disposed at the other end of and cooperative with said shaft to provide a lever for tipping the tree about a fulcrum provided by the thicker end of said head; and

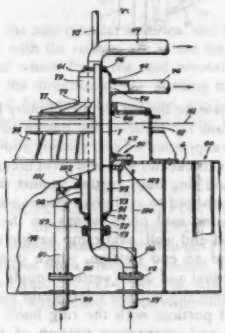
a hook disposed with respect to said head and cooperative with a surface of said tool to provide canting functions.

3,945,066

SINGLE-POINT MOORING SYSTEMS

Robert Henry Davies, Anfield, Mill Lane, Herne, Kent, England

Continuation of Ser. No. 385,345, Aug. 3, 1973, abandoned.
This application Apr. 28, 1975, Ser. No. 572,053
Claims priority, application United Kingdom, Aug. 7, 1972, 36695/72
Int. Cl.² B63B *21/52*
U.S. Cl. 9—8 P **9 Claims**



1. A mooring buoy for tanker ships having a buoyancy chamber and means for passing fluids through the buoy from an undersea pipeline to the ship, said means comprising

a. a first inlet leading to a central flow channel extending through the buoy and having a generally vertical axis,

b. at least one further inlet leading to at least one outer vertical flow channel of annular cross section located coaxially around said central flow channel,

c. said central flow channel having a lower end into which the first inlet opens and an upper end with an outlet to which a hose can be connected and a swivel bearing in the central flow channel whereby the upper end of the said channel can swivel about said vertical axis relative to said lower end,

d. said swivel bearing being axially spaced from said at least one outer flow channel,

e. each outer flow channel having a lower end into which a further said inlet opens and an upper end portion with a laterally disposed outlet, said laterally disposed outlet being rotatable about said vertical axis by means of a swivel bearing,

f. each outlet of each flow channel being located exteriorly of and axially spaced from that of any further flow channel, outside that flow channel,

g. said central flow channel being rigid along its length at least to the extent it extends within said at least one outer flow channel, all the said central and outer flow channels being sealed from one another and deriving structural rigidity from a next innermost said channel against bending forces acting transversely to said vertical axis, and

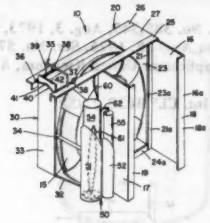
h. the swivel bearing of each said outer flow channels being located exterior of and axially spaced from any further flow channels outside the flow channel which it seals, and comprising sealing elements and distinct bearing elements.

3,945,067

QUICK-RELEASE STORAGE OF A LIFE RING AND LIFEBUOY MARKERS

Robert M. Salvarezza, 110 Braemar Drive, Hillsborough, Calif. 94010

Filed Feb. 4, 1975, Ser. No. 546,880
Int. Cl.² B63C 9/22
U.S. Cl. 9—14 4 Claims



1. In a quick-release device for a ring buoy having spacing and support means for securing the device to a bulkhead, a stationary frame supported by said spacing and support means and providing a vertical end wall and pivot means spaced from said end wall, said ring buoy resting against said end wall, a swingable ramp pivoted to said pivot means with its center of gravity well beyond said pivot means on the opposite side thereof from said end wall, said ramp having a short bottom wall portion, and an end portion, which during stowage is substantially vertical and when vertical snugly holds said ring buoy, and a connecting portion joining said bottom wall portion to said end portion, with the ring buoy resting on the bottom portion and connecting portion of said ramp and against its said end portion, and latch and release means supported by an upper portion of said frame for engaging said ramp's end portion near an upper edge thereof when said end portion is vertical, and having release means for releasing said latch upon a simple upward pull, releasing said upper edge, the combination therewith of:

auxiliary, open-top, closed-bottom holding means secured to and movable with said ramp for loosely holding, to one side of said ring buoy and in a vertical position during stowage, lifebuoy marker means,

said holding means also including a stowage compartment for a painter line secured to said ring buoy and to said marker means,

whereby said ramp seeks its natural center of gravity and swings out around said pivot means and provides a ramp pathway projecting the ring buoy out and away from a vertical drop and causing it to describe a trajectory that frees it from the ship, and said holding means is simultaneously inverted to dump said lifebuoy marker means and said painter line and thereby to actuate said lifebuoy marker means.

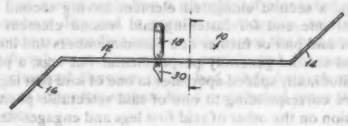
3,945,068

SWIMMER'S AID

Fred L. Carbonero, 1623 Kingsmere, Rochester, Mich. 48063

Filed Nov. 1, 1974, Ser. No. 519,870
Int. Cl.² A63C 15/00; A63B 69/12
U.S. Cl. 9—310 J 5 Claims

1. A swimmer's aid adapted to be held in a swimmer's hands and held forwardly of the swimmer in the water with the swimmer kicking his legs to propel himself, comprising a board-like structure having a central portion of a size to receive the swimmer's hands, a forward portion which is fixedly upturned to inhibit any tendency of the forward end of the aid to dive into the water during use of the aid and a rearward portion which is fixedly downturned to act as a drag in the water during use of the aid, and means on the upper surface



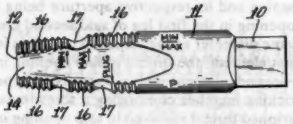
of said central portion for engagement of the hands of a swimmer during use of the aid.

3,945,069

THREADING TAPS

Robert J. Cecil, 1505 Ogden NW., Warren, Ohio 44483

Filed June 21, 1974, Ser. No. 481,894
Int. Cl.² B23G 5/06
U.S. Cl. 10—141 R 5 Claims



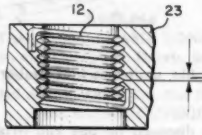
1. A threading tap capable of continuous forward threading movement without intermediate backing-off, said tap having a plurality of longitudinally extending flutes forming a plurality of longitudinally extending lands therebetween, each of said lands having similar full-shaped thread-cutting teeth formed thereon, and each land having at least one cross-groove formed therein of arcuate shape in a direction longitudinally of the land and of a length equal to at least two teeth and of a depth greater than the root depth of adjoining teeth to thereby establish communication between adjoining flutes, each cross-groove in each land being longitudinally off-set from each cross-grove in an adjoining land to provide for chip clearance and yet not materially weaken the structure of said tap.

3,945,070

WIRE THREAD CAST INSERT

Frank William Hauser, Santa Monica, Calif., assignor to Avia Instrument Company, Lafayette, Calif.

Filed May 19, 1975, Ser. No. 578,643
Int. Cl.² B21D 53/24
U.S. Cl. 10—1 A 7 Claims



1. A method of providing a threaded opening of given thread pitch in a cast body of material having a predetermined shrinkage upon solidification comprising the steps of:

a. forming a wire of given cross-sectional shape into a helical configuration wherein the pitch of the helical turns is adjusted over a major length of the configuration to a given value greater than said given thread pitch;

b. introducing an internal support into said helical configuration of outside diameter corresponding substantially to the inside diameter of the helical configuration;

c. casting material around said helical configuration and support until the material hardens into a solid body;

d. removing said internal support to leave a threaded opening in said body; and, e. cooling said body so that the shrinkage of said body during said cooling reduces the pitch of said helical configuration from said given value to said given thread pitch so that the final threads in the opening have said given thread pitch.

3,945,071

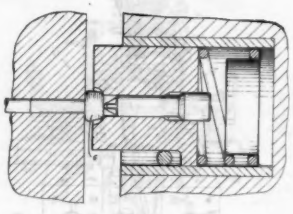
APPARATUS FOR COLD FORMING RECESSES IN THE HEADS OF SCREW FASTENERS

Rodman C. Flodin, Mattapoisett, Mass., assignor to Phillips Screw Company, Natick, Mass.

Filed Jan. 21, 1974, Ser. No. 435,217

Int. Cl.² B23G 9/00

U.S. Cl. 10—7 **16 Claims**



1. A finishing punch for cold forming a recessed head in the upset end of a screw blank in a multiple-blow header machine comprising:

an elongate punch pin having a recess-forming nib at its forward end, the nib including a plurality of wings radiating therefrom for forming a similarly shaped driver-receptive recess, the rear end of the punch pin defining an impact surface which is symmetrically disposed about the longitudinal axis of said pin, the impact surface defining an area not substantially greater than that defined by the diameter of the finished head of the screw to be formed;

pin carrying means for carrying the pin toward and away from the upset end of the screw blank with the axis of the pin in substantial registry with the axis of the screw blank, the pin carrying means having a bore formed therethrough to receive the punch pin, the bore and punch pin being dimensioned to enable the pin to slide, and cant in the bore and to rotate freely within the bore and to enable the rear end of the pin to be impacted after the pin has been carried into engagement with the upset end of the blank;

the diameter of the bore, at least at its forward end, being smaller than the diameter of the upset end of the screw blank.

3,945,072

APPARATUS FOR THE CONTROL OF DIE HEADS OF PRESSES WITH MOVABLE DIES

Emil Enody; Sandor Kovacs; Istvan Gelanyi; Bela Karoly, and Bela Kacsmarek, all of Budapest, Hungary, assignors to Ateliers J. Hanrez S.A., Monceau-sur-Sambre, Belgium

Filed June 30, 1975, Ser. No. 591,459

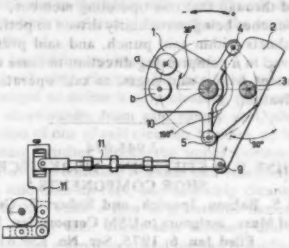
Claims priority, application Hungary, July 4, 1974, 9445

Int. Cl.² B21J 13/02

U.S. Cl. 10—13 **3 Claims**

1. In presses with movable dies, especially screwmaking machines consisting, as principal constructional elements, of a die head mounted on a shaft, two dies in the die head, and a pair of rollers on the die head,

the use of controlling apparatus comprising a pivot shaft, a controlling fork mounted for pivotal movement on said shaft, a portion of said fork being adapted for rolling contact with the rollers on the die head, the sections of said portion nearest to the pivot shaft being circular arcs of the same radius, the centre point of each arc lying on the pivotal axis of the controlling fork, while those sections of the said fork which are farther from the pivot



shaft than the said circular sections, and which are in use in contact with the rollers, are in the form of curves the distance of which from the said pivotal axis lightly increases in the direction of the working movement of the rollers, and between the circular arc sections and the sections deviating from a circular arc shape there are connecting transitional sections.

3,945,073

MACHINES FOR PUNCHING AND FOR CLOSING WIRE BINDING ELEMENTS

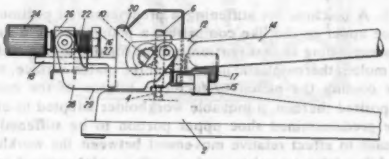
Sidney George William Adams, Walton-on-Thames, England, assignor to James Burn Bindings Limited, England

Filed Jan. 24, 1974, Ser. No. 436,213

Claims priority, application United Kingdom, Jan. 31, 1973, 4935/73

Int. Cl.² B42B 5/10

U.S. Cl. 11—1 A **4 Claims**



1. A machine for punching and, subsequently, binding, a packet of sheets into book form, said machine being adapted for use with a wire binding element of the type that must be compressed from an open loop configuration to a closed loop configuration through a series of perforations in said packet of sheets, said machine comprising

a punch that includes a series of punches for forming a series of perforations in said packet of sheets,

a press for binding said packet of sheets together with said wire binding element, said press including a movable press plate adapted to compress said wire binding elements against a fixed press plate from open loop to closed loop configuration through the perforations in said packet,

a first mechanical drive connected with said punch, said first mechanical drive being adapted to move said punches through a lesser distance at a greater mechanical advantage than said press plate is so moved, said first mechanical drive comprising a pinion connected to said operating member, and said pinion meshing with a rack formed on each of said punches,

a second mechanical drive connected with said press, said second mechanical drive being adapted to move said

press plate through a greater distance at a lesser mechanical advantage than said punches are so moved, said second machanical drive comprising a link connecting said press plate and said operating member, and

an operating member connected with said first and second mechanical drives for operating said mechanical drives when desired, both said punch and said press being operated through that one operating member,

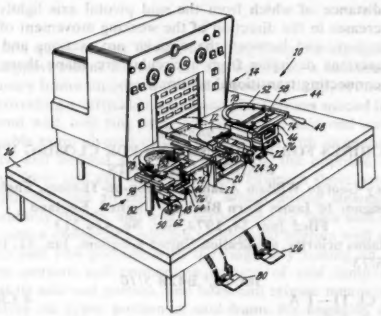
said punches being particularly driven to perforate a packet of sheets within said punch, and said press plate being moved in a compressing direction to close a wire binding element within said press, as said operating member is activated.

3,945,074

MACHINE FOR STIFFENING WORKPIECES SUCH AS SHOE COMPONENTS

Edward S. Babson, Ipswich, and Robert F. Gorini, Beverly, both of Mass., assignors to USM Corporation, Boston, Mass.

Filed Jan. 6, 1975, Ser. No. 538,819
Int. Cl.² A43D *11/00*
U.S. Cl. 12—52 **13 Claims**



1. A machine for stiffening a predetermined portion of a shoe upper or the like comprising a platen having a surface corresponding to that portion, means for depositing a charge of molten thermoplastic material on the platen surface, means for cooling the platen to facilitate release of the material deposited thereon, a movable workholder adapted to expose the predetermined shoe upper portion to be stiffened, and means to effect relative movement between the workholder and the platen to register and press the predetermined portion against the molten or at least tacky layer of the deposited charge and then separate the workholder with the charge printed on the upper.

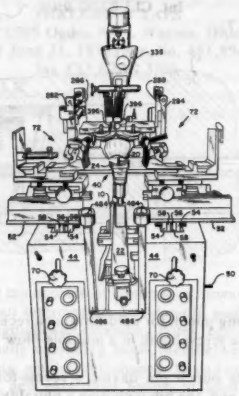
3,945,075

CEMENT LASTING THE SIDE AND HEEL PORTIONS OF A SHOE ASSEMBLY

Walter Vornberger, Tewksbury, Mass., assignor to International Shoe Machine Corporation, Nashua, N.H.

Division of Ser. No. 467,522, May 6, 1974. This application May 19, 1975, Ser. No. 578,682
Int. Cl.² A43D *21/00*
U.S. Cl. 12—145 **3 Claims**

3. A method, operable on a shoe assembly formed of a last having an upper mounted thereon and an insole located on its bottom, for applying cement in the corner between a particular portion of the margin of said upper and the periphery of the corresponding portion of the insole and for wiping said margin portion against said insole comprising: providing wiping means mounted for movement, in a prescribed plane substantially parallel to the bottom of the wiping means, in wiping stroke between a retracted position and an advanced position; providing a bar mounted for heightwise movement in a path that is at right angles to said plane; providing a shoe assembly support that is secured to and extends upwardly of the bar; so supporting the shoe assembly bottom-up on the support that said insole portion substantially lies in a plane parallel to said prescribed plane; initially retaining the wiping means in its retracted position; initially retaining the bar, together with the support, in a lower position; placing a hold-down in a working position in a prescribed location above the support wherein the bottom of the hold-down lies in a wiping plane that is substantially coextensive with the bottom of the wiping means; thereafter yieldably raising the bar, together with the support, to cause said insole portion to bear against the hold-down and thus locate said insole portion in said wiping plane; thereafter locking the bar against the heightwise movement; thereafter moving the hold-down away from said



working position to a remote position spaced from the shoe assembly whereby said insole portion is retained in said wiping plane by said locking of the bar; thereafter causing a cement applying member to have cement applying movement between a starting position and a final position along said corner past said prescribed location, the movement of the hold-down to said remote position preventing interference between the cement applying member and the hold-down during said cement applying movement; applying cement by the cement applying member into said corner during said cement applying movement; thereafter raising the cement applying member upwardly of the insole; and thereafter moving the wiping means through said wiping stroke to wipe said margin portion against the corresponding portion of the insole and bond said margin portion to the corresponding portion of the insole by means of the cement.

3,945,076

CIRCULAR TOOTHBRUSH

Thomas Sung, 217 Park Row, New York, N.Y. 10038

Filed Dec. 10, 1974, Ser. No. 531,312
Int. Cl.² A46B *13/02*
U.S. Cl. 15—21 R **6 Claims**

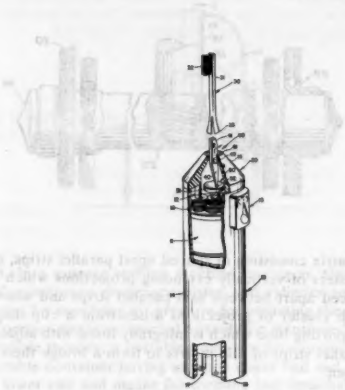
1. A circularly movable toothbrush comprising:

A. A handle comprising a housing which is adaptable for manual clasping, having sides and top and bottom and a rotary drive means and power source mounted within said housing, and an externally mounted actuating means for reversibly operating the rotary drive means;

B. driving means comprising a drive shaft driven by said rotary driving means, a fly wheel connected at its center to said drive shaft, and loosely connected on its opposite side in an off center position to an actuating rod; said actuating rod extending through a head mount portion to a joint portion, and being rotated by said fly wheel in a

circular motion to define a circular pattern at and beyond said head mount portion;

C. said actuating rod being double countersunk at the head mount portion to define a narrow shank portion, a horizontal opening through said narrow shank portion, a guide pin having a diameter of less than said horizontal opening and passing loosely through the opening in said narrow shank portion formed by the double countersink,



and said rod rotating at said fly wheel while moving vertically at the portion where the guide pin passes therethrough; and

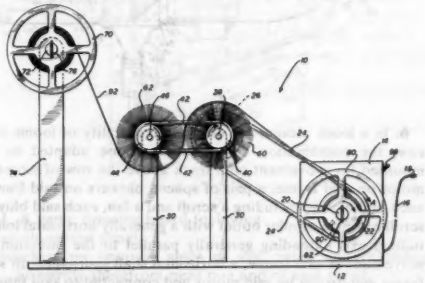
D. a toothbrush having a stem which is interchangeably attached to said joint portion, having bristles which remain in alignment with teeth striations and interdental spaces of the teeth when turning in the circular pattern defined by said actuating rod.

3,945,077

STRIP CLEANING MECHANISM

James W. Elsbery, 42-65 Kissena Blvd., Flushing, N.Y. 11355, and Raymond Marshall Smith, Region Drive, Gibsonia, Pa. 15044

Filed Feb. 3, 1975, Ser. No. 546,630
Int. Cl.² A46B *13/02*
U.S. Cl. 15—77 **10 Claims**



1. A strip cleaning mechanism comprising:

a pair of strip cleaning brushes disposed on aligned and parallel brush shafts spaced a distance to accomodate the brushes with their bristles in close proximity to each other;

drive means for rotatably driving said pair of brushes in the same direction;

a strip supply reel rotatably disposed on a supply reel shaft positioned parallel with and to one side of said brush shafts, and at a level which is relatively higher then the level of said brush shafts;

a strip take-up reel disposed on a take-up shaft positioned parallel with and to the other side of said brush shafts and at a level which is relatively lower than the level of said brush shafts;

drive means for driving said take-up reel;

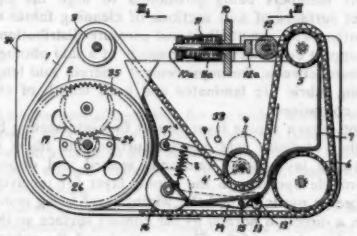
said supply reel, strip cleaning brushes, and take-up reel being arranged to define a strip cleaning path extending relatively downwardly from said supply reel, about the lower portion of one of said cleaning brushes, up between said cleaning brushes, about the upper portion of the other one of said cleaning brushes, and relatively downwardly to said take-up reel; and said strip cleaning path being such that when a film strip extends therethrough from said supply reel, about said brushes, and to said take-up reel that a predetermined tension is applied to the film strip to insure proper contact with said brushes and proper cleaning of the film strip.

3,945,078

FLOOR SCRUBBER

Mario Acquaro, S. Antonio Abate, Pietravairano (Caserta), Italy

Filed Oct. 15, 1974, Ser. No. 514,892
Claims priority, application Italy, Oct. 16, 1973, 40435/73
Int. Cl.² A47L *11/28*
U.S. Cl. 15—99 **9 Claims**



1. A floor scrubber comprising:

a frame with an open bottom and two parallel sidewalls;

an upwardly open receptacle for a treatment liquid located between said sidewalls in said frame;

a set of guide rollers with horizontal axes journaled in said sidewalls;

an endless belt of liquid-absorbing material passing around said guide rollers, said belt having a lower run projecting downwardly from said open bottom and an upper run dipping into said receptacle;

a pair of arms mounted in said receptacle for swinging about a pivotal axis parallel to those of said guide rollers, said arms terminating in a pair of downwardly open journal bearings;

a further roller disposed in said receptacle above said upper run with an axle lodged in said journal bearings; and

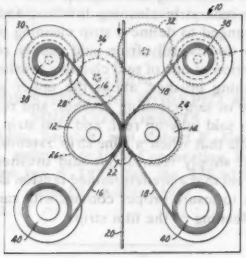
spring means engaging said arms for urging said further roller downwardly against said upper run to tension said belt, said arms being upwardly swingable against the force of said spring means to a sufficient extent to enable dislodgment of said axle from said journal bearings and withdrawal of said further roller from said receptacle to facilitate removal of said belt from said guide rollers around one of said sidewalls.

3,945,079

LAMINATED PHOTOGRAPHIC FILM CLEANING FABRIC

Walter M. Westberg, Troy Township, Saint Croix County, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 31, 1975, Ser. No. 563,388
Int. Cl.² B08B *11/00*
U.S. Cl. 15—100 **10 Claims**



1. In an apparatus for cleaning photographic film upon movement thereof along a path defined on said apparatus, which apparatus has cleaning means comprising a pair of adjacent support members defining opposed narrow, parallel support edges disposed transverse to said path; two lengths of cleaning fabric extending between said support edges, the opposed contact surfaces of the sections of cleaning fabric between said support edges defining part of said path, said support members being positioned to urge the opposed contact surfaces of said sections of cleaning fabric toward each other with essentially equal pressure distribution along said support edges during the passage of a said photographic film therebetween; the improvement wherein said lengths of cleaning fabric are laminates and each length of cleaning fabric comprises:

a non-woven wiping layer of soft fine intersecting bonded fibers defining said contact surface, the fibers in said wiping layer being randomly spaced and disposed to provide openings in the wiping layer for receiving said foreign particles, and the wiping layer being compacted in a direction normal to the contact surface so that few ends or loops of the fibers project past the contact surface; thereby restricting shearing or tearing loose of the fibers by a passing photographic film; an

an open non-woven lofty backing layer adhered to the surface of said wiping layer opposite said contact surface, said backing layer comprising stiff resilient randomly spaced and disposed bonded fibers and being sufficiently thick to be supported in a partially compressed condition by said support members to evenly press said contact surface into intimate engagement with a said photographic film between said lengths of cleaning fabric and to maintain such contact by expanding or being further compressed to compensate for irregularities in the film.

3,945,080

BROOM ASSEMBLY

William F. Hamner, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 20, 1974, Ser. No. 525,544
Int. Cl.² A46D *9/02*
U.S. Cl. 15—187 **3 Claims**

1. A broom assembly for sweeping litter from large surface areas which comprises in combination:

a. a handle member;

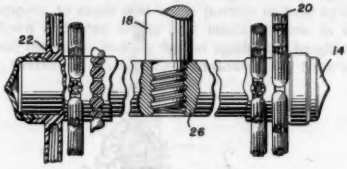
b. an elongated brush head of circular cross-section characterized by:

i. an inner cylindrical support core;

ii. a molded, thermoplastic, brushing surface circumferentially mounted on said support core;

iii. a centrally disposed bore which extends through the entire width of the brush head, with the bore being adapted for receiving and engaging said handle member at either end of the bore;

c. said molded, thermoplastic, brushing surface being characterized by:



i. a matrix consisting of spaced apart parallel strips; and

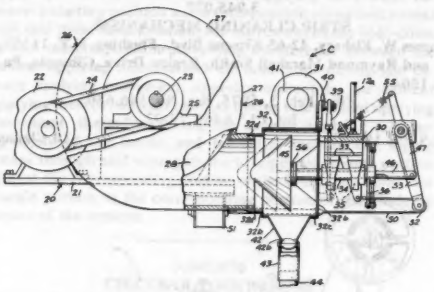
ii. clusters of vertically extending projections which are spaced apart between said parallel strips and wherein each cluster of projections arises from a cup-shaped supporting base which is integrally fused with adjacent parallel strips of said matrix to form a bridge therebetween.

3,945,081

LOOM CLEANER

Virgil W. Cook, Charlotte, N.C.; Charles D. Spates, Fairfield, Iowa; Charles Wayne Heil, deceased, late of Fairfield, Iowa; by Terry W. Heil, executor, and Diers, executrix by Kay A., both of Fairfield, Iowa, assignors to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed Mar. 27, 1974, Ser. No. 455,199
Int. Cl.² A47L *5/38*; B08B *5/04*
U.S. Cl. 15—312 R **14 Claims**

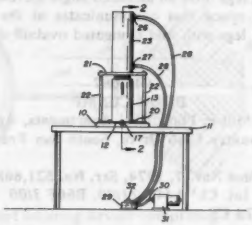


6. In a loom cleaner for cleaning a plurality of looms in a row, the combination comprising a frame adapted to be mounted for movement on a track above the row of looms, a motor on said frame, a pair of spaced blowers on said frame, each said blower including a scroll and a fan, each said blower scroll having a tubular outlet with a generally horizontal longitudinal axis extending generally parallel to the direction of movement of said frame, a horizontal shaft journalled on said frame and driven by said motor and connected to said fans of said blowers, a plenum associated with the outlet of each blower, a plurality of blower tubes extending downwardly from each said plenum, each said plenum being mounted for swinging movement about said horizontal axis of said associated outlet, and means for oscillating said plenums about their respective axes.

3,945,082
SAUSAGE STUFFING MACHINE

Edward Romian, Box 74, Oak Leaf Estates, R.D. No. 2, West Middlesex, Pa. 16159

Filed Nov. 1, 1974, Ser. No. 519,864
Int. Cl.² A22C *11/00*
U.S. Cl. 17—33 4 Claims

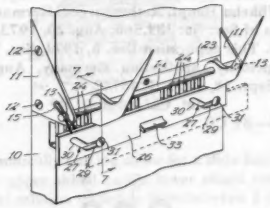


1. In a sausage stuffing machine having an elevated vertically positioned pneumatic piston and cylinder assembly and means for supplying air pressure for actuating the same and a secondary piston connected to said first mentioned piston and movable thereby; a portable container for sausage meat, said portable container having an open upper end and a flange on its lower end and means for locating and detachably holding said container in a position in said machine below said secondary piston for registry therewith, said means including a base supporting said portable container and supporting said elevated piston and cylinder assembly in spaced relation thereabove so that actuation of said piston and cylinder assembly moves said secondary piston into and out of said portable container when the same is in said machine, clamping arms on said base arranged to engage said flange on said portable container, said portable container having a bottom with an opening therein and an extrusion tube communicating with said opening and extending outwardly from said container.

3,945,083
GAME DRESSING BOARD

Lawrence H. Heightshoe, Rte. 1, Backus, Mich. 56435

Filed Mar. 31, 1975, Ser. No. 563,497
Int. Cl.² A22B *1/00*
U.S. Cl. 17—44.2 7 Claims

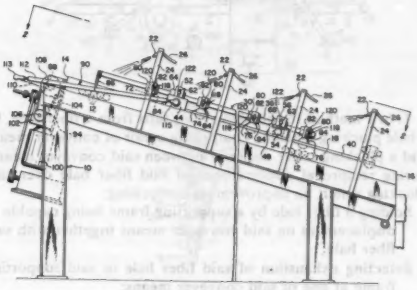


1. A game dressing board including:
an elongated panel,
brackets on opposite sides of said panel and extending forwardly therefrom near one end of said panel,
a rod supported by said brackets in spaced relation to said board and extending transversely of said panel,
a plate secured to said panel having spaced notches therein in the edge directed toward the other end of the said panel,
a pair of hook-shaped elements slideably supported on said rod having impaling hooks on one side thereof, and having lugs on the other side thereof engageable selectively in any of said notches,
said hook-shaped elements being pivotal from a first position with the ends thereof adjoining said panels in which said lugs are disengaged from said notches to a second position in which said hook-shaped elements are spaced from said panel and said lugs are engaged in selected notches.

3,945,084
SCALLOP SPREADING DEVICE

Elmer D. Willis, Williston, N.C., assignor to Willis Brothers, Inc., Williston, N.C.

Filed Feb. 13, 1973, Ser. No. 332,188
Int. Cl.² A22C *29/00*
U.S. Cl. 17—73 9 Claims

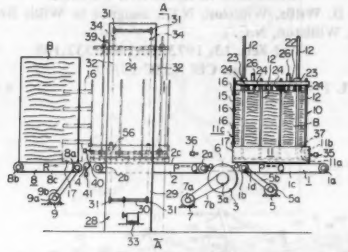


1. A scallop spreading device for use with a scallop eviscerator formed by a plurality of counter-rotating rollers rotatably mounted on a frame to form an inclined path, with the axes of the rollers aligned transversely of the path, said spreading device comprising:
a. a travelling frame mounted on the eviscerator frame for reciprocating movement relative to the eviscerator frame and the counter-rotating rollers;
b. a plurality of spaced spreader bars mounted on said travelling frame with the axes of said spreader bars being substantially parallel to the axes of the rollers and the clearance between the bottom of the spreader bars and the top of the rollers being slightly less than the diameter of the scallops being processed;
c. drive means connected to said travelling frame for imparting reciprocating movement to said travelling frame in a plane aligned with the inclined path, the downstroke of said reciprocating movement moving said travelling frame in the direction toward the lowermost roller of said eviscerator, and the upstroke of said reciprocating movement moving said travelling frame in the direction toward the uppermost roller of said eviscerator; and
d. adjustment means connected to said travelling frame for varying the height of said spreader bars above the eviscerator rollers, said adjustment means including first height adjusting means connecting each spreader bar with said travelling frame for individually adjusting the height of each spreader bar, said first height adjusting means for each spreader bar comprising a plurality of brackets to which the spreader bar is secured, each bracket having an elongated slot and being movable within the limits of the elongated slot to various heights, and means for securing the bracket to the travelling frame at any height within the slot.

3,945,085
METHOD AND APPARATUS FOR PLUCKING FIBER TUFTS FROM A FIBER BALE

Takashi Katoh, Kariya, and Susumu Otani, Obu, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Sept. 5, 1974, Ser. No. 503,267
Claims priority, application Japan, Sept. 8, 1973, 48-101548; Sept. 8, 1973, 48-101549
Int. Cl.² D01G 7/06
U.S. Cl. 19—80 R **12 Claims**



1. In a method for plucking fiber tufts from a fiber bale, by a bale plucking machine comprising a pair of conveyer means and a plucking roller disposed between said conveyer means, during reciprocal displacement of said fiber bale over said plucking roller, an improvement comprising:

holding a fiber bale by a supporting frame being capable of displacement on said conveyer means together with said fiber bale;

detecting exhaustion of said fiber bale in said supporting frame at one of said conveyer means;

thereafter displacing said supporting framae to a waiting position outside the terminal of said reciprocal displacement of the other one of said conveyer means by means of said conveyer means;

positioning said supporting frame at said waiting position by stopping said conveyer means;

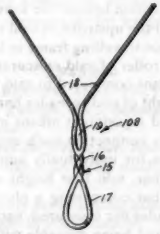
then supplying a fresh fiber bale into said supporting frame positioned at said waiting position;

after completion of said supply of said fresh fiber bale into said supporting frame, displacing said supporting frame toward said plucking roller by means of said other one of said conveyer means and, thereafter, carrying out normal bale plucking operation.

3,945,086
CLOSURE DEVICE

Bert V. Hoard, Rte. 10, Box 34, Shelton, Wash. 98584

Filed Feb. 15, 1974, Ser. No. 442,889
Int. Cl.³ B65D 77/10
U.S. Cl. 24—30.5 T **1 Claim**



1. A closure device made of wire into an overall one piece Y-shaped configuration, comprising:

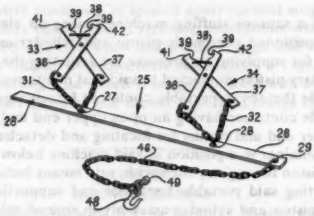
a. a shank serving as the stem of the Y configuration, having, a loop of wire creating a central eye at the terminal end of said shank, having also a twisted wire stem portion midway on said shank, and having, in addition, a formed wire portion creating an elongated ovaloid slot at the opposite end of said shank; and

b. a pair of diverging legs formed of wires continuing on from said elongated ovaloid slot portion whereby said diverging legs form an included angle therebetween comprising a space that communicates at the juncture of diverging legs with said elongated ovaloid slot.

3,945,087
DOOR CLAMP

Ray Andrew Miller, Plaza Real Apartments, Apartment No. 10, 161 Country Club Drive, South San Francisco, Calif. 94080

Filed Nov. 7, 1974, Ser. No. 521,668
Int. Cl.² A44B 21/00; B66F 3/00
U.S. Cl. 24—73 CS **6 Claims**



6. A one-man operable door clamp comprising, in combination with a stop pin in the floor of the igloo and a firmly latched side door thereof, a lever having at least two apertures therein arranged in spaced relation to one another, a flexible element looped through each of said apertures and a pair of pivotally connected spring-loaded links secured to said flexible elements so that the outer end of said side door is engageable in spaced apart relationship by a pair of opposed jaws on each of said pair of pivotally connected links.

3,945,088
SPACER STRIP, ESPECIALLY FOR ELECTRICAL HEATING MATS

Dieter Altmann, Gruendau-Lieblos, and Eberhard Haupt, Gruendau-Rothenbergen, both of Germany, assignors to Firma Wilhelm Haupt, Rothenbergen, Germany

Division of Ser. No. 389,566, Aug. 20, 1973, Pat. No. 3,874,910. This application Dec. 6, 1974, Ser. No. 530,207
Claims priority, application Germany, Aug. 22, 1972, 2241201; Sept. 18, 1972, 2245742
Int. Cl.² A44B 21/00
U.S. Cl. 24—81 CC **10 Claims**

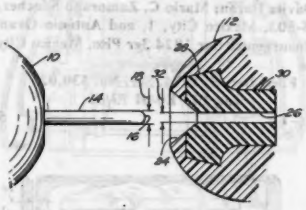
1. A spacer strip for holding elongated elements in spaced relationship to each other, comprising a strip body of elastic thermoplastic material, a plurality of substantially equally spaced apart open sided element receiving grooves in said strip body, said grooves extending substantially across said strip body, and coupling means across at least one end of the strip body for interconnecting a plurality of strip bodies in series with each other, said coupling means being spaced a distance from the adjacent groove that is substantially equal to half the distance between adjacent grooves.

3,945,089

SECURING DEVICE

Kenneth M. Gagnon, 302 Reservoir Ave., Lincoln, R.I. 02865

Filed Jan. 20, 1975, Ser. No. 542,436
Int. Cl.² A44B 9/00; A44C 7/00
U.S. Cl. 24—155 SD 1 Claim



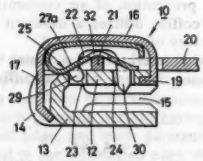
1. A two-part securing device comprising a first part having a cylindrical stud extending therefrom, a second part into which the stud may pass, said second part having a hollow cap portion, a resilient clutch gripped in the hollow cap, said clutch having a central opening therethrough of substantial length flared at one end, the cross sectional area of the opening being less than the cross sectional area of the stud, said stud having a chamfered end to permit entry to the flared end of said opening, said clutch having a body section of at least two thickness, that extend radially outward from the opening, the greater thickness being positioned in the cap portion at the flared end of said opening at the outer face and the lesser thickness being inwardly of the cap and wherein the clutch is integrally molded and grippingly secured in a mass of solid plastic of the cap portion.

3,945,090

AUTOMATICALLY LOCKING SLIDER FOR SLIDE FASTENERS

Takeo Fukuroi, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Oct. 22, 1974, Ser. No. 516,905
Claims priority, application Japan, Oct. 29, 1973, 48-125153
Int. Cl.² A44B 19/30
U.S. Cl. 24—205.14 R 2 Claims



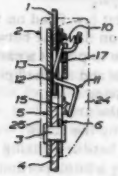
1. An automatically locking slider for a slide fastener which comprises an upper shield and a lower shield connected in spaced parallel relation to define therebetween a channel for the passage of two opposed slide fastener stringers carrying respective rows of interlocking elements, said upper shield having wall surfaces defining a cavity, and an aperture communicating with said channel; a yoke attached to said upper shield; a pull having a pivotal end received in said yoke for pivotal movement relative thereto; and releasable locking means disposed inside said yoke and having a resilient U-shaped structure bearing a locking prong and resiliently biasing same to extend through said aperture to engage at least one of said stringers and thereby lock the slider against movement relative thereto; said pull tab being manipulatable in each of two opposite directions to release the locking means and move the slider therealong, said locking means structure having a lug extending into said cavity for movement relative thereto upon flexing of said structure, said lug being arranged to move in abutment with one wall surface of said cavity when the pull tab is manipulated in one direction to release the locking means, and arranged to move in abutment with an opposite wall surface of said cavity when the pull tab is manipulated in the opposite direction to release the locking means thereby correspondingly limiting free longitudinal movement of the locking means.

3,945,091

BUCKLES FOR SAFETY BELTS

Stig Axel Goran Farlind, Monsteras, Sweden, assignor to STECE - AB Industrifjadrar, Monsteras, Sweden

Filed Aug. 22, 1974, Ser. No. 499,634
Claims priority, application Sweden, Sept. 4, 1973, 7312009
Int. Cl.² A44B 11/26
U.S. Cl. 24—230 A 4 Claims

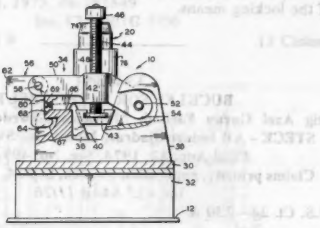


1. A buckle for safety belts for use in vehicles, preferably automobiles, aircraft and seacraft, one part of the buckle being a locking tongue and the other part a buckle body having a pocket-shaped opening for the insertion of said locking tongue thereinto, said pocket being defined in said buckle body by two fixed side plates which are spaced apart a distance substantially equal to the thickness of said locking tongue and by guides connected to said side plates co-acting with two longitudinal edge portions of said locking tongue, said buckle body including a spring-actuated latch serving as a locking means, a spring and said latch being mounted to a first one of said side plates and adapted, by spring action, to be kept in locking position in which it preferably bears against the other of said side plates, at least one shoulder of said latch being situated in said locking tongue insertion pocket for engagement with a corresponding shoulder of said locking tongue, an operating means in said buckle body located for engagement with said latch, said latch with its said shoulder positioned for movement with the aid of said operating means, against spring action, out of the locking position in said pocket to be accommodated, together with latch portions adjoining said shoulders, in a recess in the first one of said side plates, thereby releasing said locking tongue, said recess in said first side plate formed by a pressed-out portion of said plate, the upper edge of said recess constituting a mounting for said latch in that said latch pivotally bears against said upper edge, and said first side plate is provided both at the upper and the lower edges of said recess with through openings for outwardly bent portions of said latch, an upper, outwardly bent end portion of said latch co-acting with a spring of said latch, while a lower, outwardly bent end portion of said latch co-acts with said operating means for moving said latch out of locking position against the action of said spring of said latch whereby said latch in released position lies adjacent that side pocket defined by said first side plate.

3,945,092
CABLE KNOT CINCHER

Cecil L. Andrews, P.O. Box 214, Burney, Calif. 96013

Filed July 15, 1974, Ser. No. 488,710
Int. Cl.[2] A44B *21/00*; B26B *13/00*; B25B *1/04*
U.S. Cl. 24—248 L 3 Claims

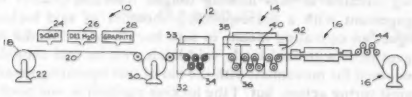


1. A cable clamp adapted to be used in conjunction with a powered winch on a skidder to cinch a knot in a cable comprising:
a base having a catch,
an upwardly facing first jaw fixed on the base,
arm means swingable on the base between an open position clearing the first jaw to permit a cable to be moved laterally onto the first jaw and a closed position extending over the first jaw and having a lug,
a screw mounted on the arm,
a second jaw carried by the screw,
a catch carried by the base and having a camming portion,
a latch member having a hook portion and pivotally carried by the arm means, and an adjustment screw carried by the lug and adapted to engage the latch member to limit movement of the hook portion of the latch member so that a camming end portion of the hook engages the upper surface of the catch and is cammed to clear the catch and then be moved thereunder by gravity, the lug engaging the top of the catch to limit downward movement of the arm beyond its closed position.

3,945,093
METHOD AND APPARATUS FOR PRODUCING HIGH MODULUS BIAXIAL FABRIC

Richard J. Larsen, Torrance, and Robert W. Mitchell, Hawthorne, both of Calif., assignors to Hitco, Irvine, Calif.

Filed June 10, 1974, Ser. No. 477,599
Int. Cl.[2] D06C *3/00*
U.S. Cl. 26—68 10 Claims

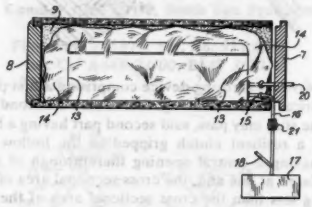


1. A continuous and dynamic method for developing high biaxial modulus in a woven graphite precursor fabric comprising the steps of:
1. stretching the fabric while heating the fabric to a temperature of at least 175°F;
2. preoxidizing the fabric by heating the fabric to a temperature of at least 400°F and applying an oxidizing atmosphere to the fabric, steps (1) and (2) being conducted while simultaneously applying a warp tension of at least 5 pounds per inch up to the breaking strength of the fabric to the fabric; and
passing the tensioned fabric around at least 180° of the alternate upper and lower surfaces of at least two closely spaced rolls, the tangential distance between said rolls being no more than 12 inches and stretching said fabric in the warp direction up to 50% while restraining fill shrinkage to no more than 2%.

3,945,094
SYSTEM FOR THE INHUMATION OF CORPSES

Jose Luis Dávila Ďarán; Mario C. Zamorano Sánchez, both of Lopez 15-503, Mexico City, 1, and Antonio Ovando Hernández, Insurgentes Sur 1824 3er Piso, Mexico City, 20, all of Mexico

Filed Dec. 5, 1974, Ser. No. 530,027
Int. Cl.[2] E04H *13/00*
U.S. Cl. 27—11 9 Claims



1. An apparatus for the elimination of organic residuals in the inhumation of a plurality of corpse-containing coffins, comprising:
a plurality of vertically arranged drawers, each drawer having an entranceway allowing the coffin to be placed therein, and each drawer having an internal inclination for drainage purposes for eliminating the organic residuals;
a plastic or polyethylene bag completely surrounding and hermetically sealing each of the coffins;
a common septic pit;
a tubing means connected to the interior of each of the coffins and passing through each of said bags for transporting the organic residuals to said septic pit and for isolating the organic residuals contained in every coffin from each other coffin;
a separate injection valve means connected to each of the coffins and passing through said hermetically sealed plastic bag for allowing a chemical composition to be repeatedly introduced to each coffin for the purpose of disinfection and the prevention of air contamination, wherein each of the coffins utilizes a different injection valve means than every other coffin; and
hermetically sealed exterior lids for closing the entranceway of each of said drawers when a coffin is introduced therein.

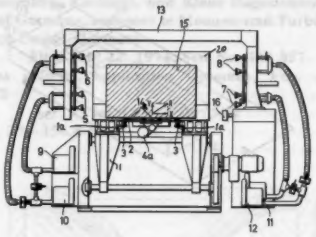
3,945,095
METHOD AND APPARATUS FOR ALIGNING A STACK OF SHEETS

Hans Herold, Bonn, and Manfred Klahre, St. Augustin, both of Germany, assignors to Hans Herold Maschinenfabrik, Bonn, Germany

Filed May 30, 1974, Ser. No. 474,684
Claims priority, application Germany, June 14, 1973, 2330245
Int. Cl.[2] B65H *31/40*
U.S. Cl. 271—210 7 Claims

4. A device for aligning the edges of a plurality of adjacent sheets arranged in a stack, comprising first and second means for supporting the stack on the support edges of the laterally adjacent sheets; means for subjecting said first supporting means and thereby the support edges of only some of the laterally adjacent sheets to a first positive oscillatory force and for subjecting said second supporting means and thereby the support edges of others of the adjacent sheets to a different

second positive oscillatory force with attendant differential displacement of the individual adjacent sheets of the stack in a predetermined direction; and means for aligningly engaging



the leading edges of the individual adjacent sheets so as to terminate said displacement thereof so that the leading edges become aligned with one another.

3,945,096

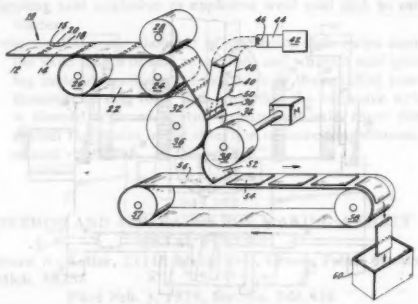
PROCESS FOR REMOVING SEPARATING THREAD FROM A WEB OF KNITTED GARMENT PORTIONS OR THE LIKE

Samuel Miranker, 4091 Bedford Ave., Brooklyn, N.Y. 11229

Continuation-in-part of Ser. No. 343,852, March 22, 1973, abandoned. This application Aug. 5, 1974, Ser. No. 494,975

Int. Cl.[2] D06H *7/02, 7/22*

U.S. Cl. 28—76 T **6 Claims**



1. Process for removing the separating thread that is between garment portions, the garment portions having been manufactured in the form of a continuous web of garment portions, with each garment portion having a finished edge and an unfinished edge, and each garment portion finished edge being joined to the unfinished edge of the neighboring garment portion by separating thread, and the separating thread being of the type to be destroyed by heat, said process comprising:

moving the web through a heating zone generally along a particular direction;

heating air to a temperature sufficient to destroy the separating thread and blowing the heated air from a source above the surface of the web against a surface of the web to define the heating zone and controlling the air flow so as to form a stream of heated air that is concentrated over a relatively short length of the web along the particular direction and over the entire width of the web and the entire stream being controlled to blow in a direction that is obliquely transverse to the particular direction of the web and such that the heated air is aimed to strike the finished edge of each of the garment portions that is joined by separating thread thereby initially destroying the separating thread on the finished edge of each previously joined garment portion such that the separating thread recedes from the finished edge and the residue of the separating thread remains on the unfinished edge of each previously joined garment portion.

3,945,097

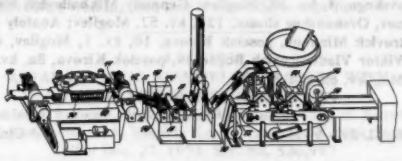
APPARATUS FOR MAKING EXPANDED METAL LEAD-CID BATTERY GRIDS

Elon Daniels, Jr., Frankton, and Richard H. Kline, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 502,787, Sept. 3, 1974, abandoned, which is a division of Ser. No. 398,974, Sept. 20, 1973, Pat. No. 3,853,626. This application Apr. 29, 1975, Ser. No. 572,736

Int. Cl.[2] B21D *31/04*

U.S. Cl. 29—2 **3 Claims**



1. Apparatus for making continuous strips of expanded lead from narrow lead ribbons having a predetermined thickness, which strips are suitable for pasting and cutting into lead-acid storage battery plates, said apparatus comprising:

an elongated stripper plate along which said narrow lead ribbon advances longitudinally;

an expansion gauntlet comprising two rows of progressive dies and cutters wherein said rows flank said plate and comprise a plurality of movable dies and fixed-position cutters which converge in incremental steps on the longitudinal center line of said plate;

said dies being reciprocally movable to and from said cutters and adapted to coact with the cutters to periodically shear and stretch a plurality of wire-like segments from the longitudinal edges of said ribbon which segments extend at acute angles to the ribbon in the direction of said dies' movement;

means for reciprocating said dies;

means for periodically advancing said ribbon between said rows so as to yield two reticulated portions comprising a plurality of said segments interconnected in a single tier and a plurality of said tiers wherein successive tiers are offset one from the other such that nodes are formed joining the ends of adjacent segments in one tier to the centers of segments in successive tiers and together defining a plurality of battery paste-retaining cells, said reticulated portions extending at acute angles from the ribbon in gull-wing fashion when viewed head-on;

curved plow means at the strip-exit end of said expansion gauntlet for receiving said gull-wing shaped strip and folding the reticulated wing portions thereof down into a position more nearly in the same plane as the starting ribbon;

a beveled roller at the strip-exit end of said plow means for engaging and substantially leveling out any residual humps left in the reticulated wing portions left in the strip after the plow;

forming and stretching rollers at the strip-exit end of said beveled roller, said rollers comprising coacting male and female rollers in which the male roller has alternate rows of aligned truncated pyramidal projections for engaging the individual cells of the reticulated portions and the female roller has a resilient surface layer including alternate rows of aligned recesses for receiving said projections such that the ridges between said recesses press the expanded lead of the reticulated portions toward the

bases of said projections and thereby uniformly size and stretch said portions; and

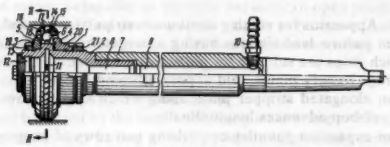
coacting upper and lower flattening rollers spaced apart by a distance greater than said predetermined thickness but substantially less than twice said predetermined thickness to flatten said reticulated portions to a thickness equal to about said distance by twisting and flattening said nodes whereby a continuous strip of expanded lead is produced having two continuously pasteable portions which are cold worked, sized and ready for pasting.

3,945,098

PULSE IMPACT TOOL FOR FINISHING INTERNAL SURFACES OF REVOLUTION IN BLANKS

Petr Ivanovich Yascheritsyn, Leninsky prospekt, 18, kv. 102, Minsk; Jury Khonanovich Golant, Orshanskoe shosse, 118, kv. 40, Mogilev; Vadim Nikolaevich Leushkin, ulitsa Tsiolkovskogo, 8, kv. 30, Mogilev; Gennady Mikhailovich Mironov, Orshanskoe shosse, 120, kv. 52, Mogilev; Anatoly Petrovich Minakov, poselok Kirova, 10, kv. 1, Mogilev, and Viktor Vladimirovich Bogachev, poselok Kirova, 8a, kv. 6, Mogilev, all of U.S.S.R.

Filed Apr. 18, 1975, Ser. No. 569,378
Int. Cl.² B24B *39/00*
U.S. Cl. 29—90 R **4 Claims**



1. A pulse-impact tool for finishing internal surfaces of revolution in blanks, installed with a provision for linear motion along the geometrical axis of the machined surface comprising: a casing in the form of a body of revolution; at least one circular groove made on the external side surface of the casing; bodies of revolution installed in the groove with a provision for moving along the groove and rotating around their own geometrical axis; the casing provided with a central axial hole; at least one channel leading from the hole in the casing, arranged in a plane transverse to the base of the groove, directed practically tangentially to the base of the groove and used to deliver fluid under pressure to the bodies of revolution which move along the groove and are rotated by the fluid around their own axes; a cage arranged concentrically with and around the groove; working elements accommodated in the cage with a provision for contacting the bodies of revolution and colliding with the bodies of revolution during tool operation; the working elements having geometrical axes which lie in one and the same plane with the geometrical axes of the bodies of revolution.

3,945,099

METHOD AND APPARATUS FOR MAKING A SURFACE WAVE TRANSDUCER DEVICE

Robert Kansy, Fort Wayne, Ind., assignor to University of Illinois Foundation, Champaign, Ill.

Division of Ser. No. 430,030, Jan. 2, 1974. This application June 6, 1975, Ser. No. 584,489
Int. Cl.² H01L *41/22*
U.S. Cl. 29—25.35 **5 Claims**

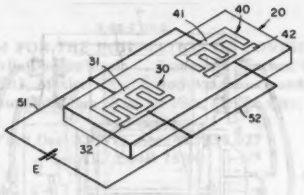
1. A method of producing a surface wave transducer of a ferroelectric ceramic substrate comprising the steps of:

a. applying a pair of interdigitated metal electrodes to a surface of said substrate;

b. applying a poling potential between said electrodes;

c. removing the electrodes;

d. applying a metal plate electrode over the region where said electrodes had been applied; and



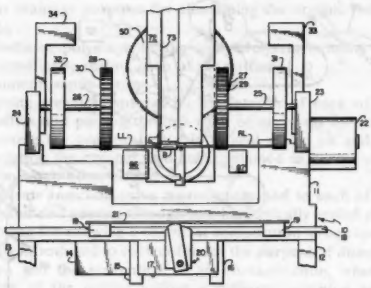
e. applying an electrode on the opposite surface of said substrate.

3,945,100

AXIAL LEAD COMPONENT PREFORMING AND INSERTION APPARATUS

Roy M. Whiting, Binghamton, N.Y.; Henry J. Soth, Brackney, Pa., and Phillip A. Ragard, Binghamton, N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,716
Int. Cl.² H05K *3/30*
U.S. Cl. 29—33 M **13 Claims**



1. An apparatus for processing electrical components having a body portion and a first and second lead portion extending from the body portion in opposite directions comprising:

means for sequentially feeding said components;

means for aligning said feed component in a first plane;

means for severing surplus lead material from said first and second lead portions;

first means for bending said first lead so that said second lead, said body and a first section of the first lead contiguous to said body are substantially perpendicular to said first plane;

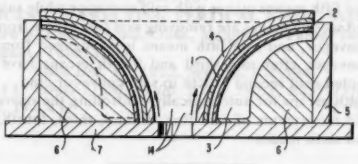
means for forming the severed extremity of said second lead at the termination of the operation of said first bending means, said forming means including an anvil aligned substantially perpendicular to said first plane to cooperate with said first bending means to form the severed end of said second lead at the termination of the operation of said first bending means; and

second means for bending a second section of said first lead so that said second section is also substantially perpendicular to said first plane.

3,945,101
ROTOR WHEEL FOR RADIAL-FLOW FANS AND TURBINES AND METHOD AND FIXTURE FOR MAKING SAME

Axel Rossmann, Karlsfeld, and Klaus Hagemeister, Munich, both of Germany, assignors to Motoren-und Turbinen Union Munich GmbH, Germany

Filed Feb. 22, 1974, Ser. No. 444,857
Claims priority, application Germany, Feb. 22, 1973, 2308672
Int. Cl.² B23P 15/04
U.S. Cl. 29—156.8 CF **2 Claims**

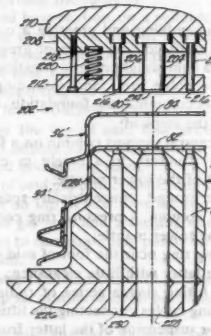


1. Method of manufacturing a sheet metal rotor wheel for radial flow fans, turbines, and the like, comprising:
positioning rotor blades in a fixture in predetermined positions corresponding to the desired final relative positions they are to occupy on the rotor wheel,
providing a sheet metal rotor dish with a layer of explosive on the radially inner surface thereof,
placing the sheet metal rotor dish in said fixture at a small spacing from the rotor blades, and
igniting said explosive to explosive weld said dish to said blades,
wherein the inner diameter of said rotor dish varies along the axial length of said rotor dish, and wherein said igniting includes igniting said explosive at the smallest inner diameter of said rotor dish such that the explosive weld is formed with sequential pressing of said rotor dish against the blades in the direction of increasing diameter of said rotor dish.

3,945,102
METHOD AND APPARATUS FOR MAKING A SHEET METAL PULLEY

Edward A. Kotlar, 21115 Mack Ave., Grosse Pointe Woods, Mich. 48236

Filed Feb. 3, 1975, Ser. No. 546,616
Int. Cl.² B21K 1/42
U.S. Cl. 29—159 R **11 Claims**

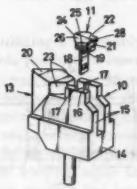


1. The method of producing a stamped sheet metal pulley comprising the steps of:
telescopically interengaging with an interference fit cylindrical first side wall portions of two stamped sheet metal cups, each cup having an integral flat bottom wall portion and an inclined integral annular flange extending generally radially outwardly adjacent the open end thereof, said cups being interengaged such that their bottom wall portions are in abutting co-planar engagement and said annular flanges are spaced apart axially to each define at least in part a groove of the pulley;
arranging said interengaged cups between punch and die means for forming a plurality of mounting holes through the bottom wall portions of both cups by engaging the periphery of the side wall portion of at least one of said interengaged cups with concentrically arranged locating means on the punch and die means;
actuating said punch and die means to form mounting holes through said bottom wall portions of both cups concentric with the central axis of the interengaged cups; and
thereafter welding said side wall portions together.

3,945,103
APPARATUS FOR ASSEMBLING SLIDERS WITH FASTENER STRINGERS

Yoshinori Fujisaki, and Shunichi Shigeno, both of Kurobe, Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Dec. 27, 1974, Ser. No. 536,997
Claims priority, application Japan, Dec. 28, 1973, 49-1402
Int. Cl.² B21D 53/50; B29D 5/00
U.S. Cl. 29—207.5 SL **6 Claims**



1. Apparatus for assembling sliders with fastener stringers, wherein each of the sliders includes a channeled body having a flared front end and a contracted rear end, and a pull tab, said apparatus comprising, in combination, a slider holder for immovably holding a pair of sliders thereon with their contracted rear ends disposed against each other for the assemblage of said fastener stringers therethough, a stringer guide arranged close to said slider holder on one side thereof, said stringer guide being adapted to cause said fastener stringers to be introduced uncoupled into one of said pair of sliders through said flared front end thereof in a streamlined manner, and a stringer separator arranged close to said slider holder on the opposite side thereof, said stringer separator being adapted to cause said fastener stringers to be separated away from each other in a streamlined manner as the same emerge uncoupled out of said flared front end of the other of said pair of sliders.

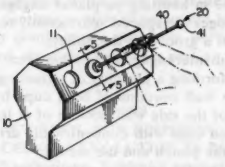
3,945,104
DIESEL ENGINE CYLINDER LINER PULLER TOOL

William S. Brookover, Jr., 965 Washburn St., Clarksburg, W. Va. 26301

Filed Apr. 25, 1975, Ser. No. 571,652
Int. Cl.² B23P 19/04
U.S. Cl. 29—255 **3 Claims**

1. A tool for removing a sleeve from a mounting structure in which the sleeve has an elongated bore and a plurality of openings along the length thereof, said tool comprising an elongated shank with a head at one end and an anvil at the opposite end, said head being of a size to be slidably received within the bore of said sleeve, movable means carried by said

head and engageable with the openings in said sleeve, clamp plate means movably mounted on said shank in spaced relationship to said head, means for securing said plate means to said sleeve for clamping said tool thereto, and impact imparting means slidably mounted on said shank intermediate said anvil and said clamp means, whereby movement of said impact imparting means against said anvil causes an outward force to be applied to said sleeve to remove the same from the structure in which it is mounted.

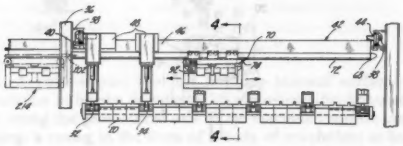


3,945,105

AUTOMATIC GRATE CHANGING SYSTEM AND METHODS OF UTILIZING AND CONSTRUCTING SAME

Thomas Beaty, Jr., 24690 Madison Court, Farmington, Mich. 48024, and Daniel Fournier, 26240 Marlene, Roseville, Mich. 48066

Filed July 19, 1974, Ser. No. 490,356
Int. Cl.² B23P 7/00
U.S. Cl. 29—401 F **10 Claims**



2. A method of utilizing an automatic system for selectively replacing articles which are removably interconnected to a stationary conveyor, said system including:

first means for clampingly engaging a first article connected to said conveyor;

second means disengaging said first article from said conveyor;

third means for positioning a second article on said conveyor at the same location previously occupied by said first article;

fourth means for connecting said second article to said conveyor;

fifth means for selectively moving said first, second, third and fourth means; and

sixth means, operably connected with said fifth means, for selectively engaging and disengaging said fifth means with and from said movable conveyor, respectively;

said method comprising the steps of:

engaging a first article connected to said conveyor;

disengaging said first article from said conveyor;

positioning a second article on said conveyor at the same location previously occupied by said first article;

connecting said second article to said conveyor;

selectively moving said first, second, third and fourth means;

selectively engaging and disengaging said fifth means with and from said stationary conveyor, respectively; and

automatically controlling the operations and movements of said first, second, third, fourth, fifth and sixth means.

3. An automatic system for selectively replacing articles which are removably interconnected to a movable conveyor, comprising, in combination:

first means for clampingly engaging a first article connected to said conveyor;

second means for disengaging said first article from said conveyor;

third means for positioning a second article on said conveyor at the same location previously occupied by said first article;

fourth means for connecting said second article to said conveyor;

fifth means for selectively moving said first, second, third and fourth means;

sixth means, operably connected with said fifth means, for selectively engaging and disengaging said fifth means with and from said movable conveyor, respectively, so that said fifth means moves with said conveyor while said first and second means are removing said first article from said conveyor, and said fifth means is disengaged from said conveyor after said third and fourth means have connected said second article to said conveyor; and

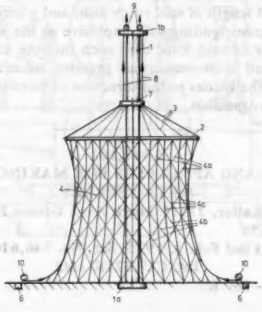
seventh means for automatically controlling the operations and movements of said first, second, third, fourth, fifth and sixth means.

3,945,106

METHOD OF MOUNTING A NATURAL DRAFT COOLING TOWER

Günter Mayr, Stuttgart, and Jörg Schlaich, Stetten, both of Germany, assignors to Balcke-Dürr Aktiengesellschaft, Ratingen, Germany

Filed Nov. 13, 1973, Ser. No. 415,570
Claims priority, application Germany, Nov. 15, 1972, 2255793
Int. Cl.² E04B 1/00
U.S. Cl. 29—429 **9 Claims**



1. A method of assembling and erecting a cooling tower, especially a natural draft cooling tower of great height and diameter which has a light-weight mantle constituted by a skin attached to multiple cable grids and extending between a single central support column and a foundation, the assembly method comprising the steps of:

constructing the central support column on a foundation as a free-standing structure to a height in excess of the intended height of the tower mantle;

assembling on the ground, concentrically spaced from the central support column, a pressure ring constituting the upper rim of the tower mantle;

positioning a lifting ring near the foot of said column so as to surround the latter with little clearance;

attaching to the lifting ring a series of radially regularly spaced supporting cables connecting the lifting ring to the pressure ring for suspension of the latter from the former at a vertical distance substantially corresponding to the difference in height between the central support column and the tower mantle;

attaching to the pressure ring the ends of at least two series of cables in a pattern of intersecting cable grids, designed to extend diagonally downwardly between the pressure ring and the foundation, to form a hyperboloid-shaped, composite cable grid as part of the tower mantle;

advancing the lifting ring upwardly along the central support column, thereby raising the pressure ring which is connected thereto and extending the cable grids which are connected to the latter; and

securing the lifting ring in relation to the central support column in the fully extended position of the tower mantle.

3,945,107

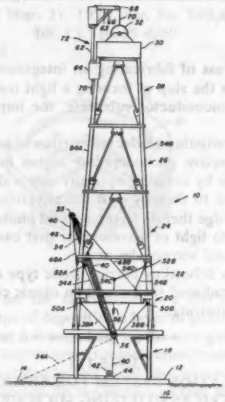
PROCESS OF ERECTING VERTICAL RISING MAST

Theodore B. Houck, Tulsa, Okla., assignor to Parker Drilling Company, Tulsa, Okla.

Filed Dec. 17, 1973, Ser. No. 425,146

Int. Cl.² E04G *21/00, 23/06;* **B21D** *39/03;* **B23P** *11/00*

U.S. Cl. 29—431 **6 Claims**



1. In a vertical rising mast system including a base section, a plurality of intermediate sections and a top section, said top section of said mast having an overhanging and rotatable auxiliary support and block means, the method of assembling said mast comprising the steps of:

a. placing said base section on a suitable foundation;

b. supporting the bottom end of a floating gin pole by a plurality of basket lines from a plurality of points near the top of said base section;

c. laterally supporting the top of said gin pole by a plurality of luffing lines attached to a corresponding plurality of points near the top of said base section, said gin pole adapted to assume various angles with the vertical under control said luffing lines;

d. by means of said gin pole, positioning the first intermediate section on top of said base section;

e. raising said gin pole and attaching said basket lines and luffing lines to corresponding points on said first intermediate section;

f. repeating steps (d) and (e) until all intermediate sections and the top section have been positioned in their proper position;

g. positioning said auxiliary support and block means, on said top section; and

h. using said auxiliary support and block means positioned on said top section, lowering said gin pole.

3,945,108

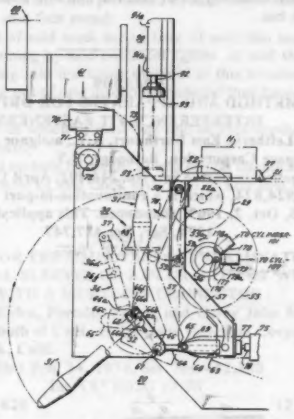
CORE INSERTER FOR FILTERS

Charles G. Stannard, East Granby, Conn., assignor to Sprinter System of America, Ltd., East Windsor, Conn.

Filed Sept. 30, 1974, Ser. No. 510,494

Int. Cl.² B23P *11/02*

U.S. Cl. 29—450 **16 Claims**



1. A method for utilizing a swingably mounted rod having a widened intermediate portion for inserting a hollow cylindrical core element into an annular shaped accordion pleated filter element which filter element is substantially non-bendable in the axial direction while being capable of expanding in the radial direction, said method comprising the steps of

a. holding the rod to an upright position;

b. depositing a filter element upon the rod so that the widened intermediate portion lies intermediate the ends of the filter element;

c. squeezing the bottom of the filter element whereby the widened portion of the rod acts as a fulcrum to enlarge the upper end of the filter element;

d. droppping the core element upon said rod and so that the core element at least partially enters the enlarged upper open end of the filter element;

e. pressing the core element downwardly into the filter element to substantially longitudinally align the core and filter elements;

f. releasing the bottom end of the filter element to enable the filter element to resume its natural configuration.

4. Apparatus of automatically inserting core elements into filter elements said core elements comprising a substantially hollow cylindrical shaped member, and said filter elements being generally annular in shape and having an accordion pleated configuration, said apparatus comprising:

a rod having a first end swingably mounted upon a shaft;

first means for moving said rod between an upright position and a downward takeoff position;

said rod having a widened portion spaced inwardly from its opposite free end;

a platform secured to said rod positioned between said widened portion and said first end;

second means for depositing a filter element upon the free end whereby said platform supports the bottom end of said filter element so that the intermediate portion of the filter element is substantially aligned with the widened portion of the rod;

third means for squeezing the bottom end of said filter element whereby the widened portion of the rod acts as a fulcrum to cause the upper open end of the filter element to become enlarged;

fourth means for moving a core element toward the free end of said rod so that the core element is immediately above the enlarged open end of the filter element;

fifth means for pushing the core element into the filter element so that the core element and the filter element are substantially longitudinally aligned;

said first means rapidly moving said rod towards the takeoff position at an angular velocity sufficient to cast the completed assembly off of said rod and into a suitable collection bin.

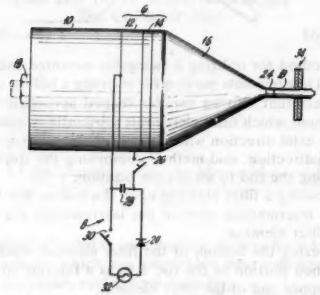
3,945,109
METHOD AND APPARATUS FOR DRIVING INTERFERENCE-FIT FASTENERS

Basil P. Leftheris, East Northport, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation-in-part of Ser. No. 244,402, April 17, 1972, Pat. No. 3,824,824, which is a continuation-in-part of Ser. No. 863,045, Oct. 2, 1969, abandoned. This application July 11, 1974, Ser. No. 487,747

Int. Cl.² B23P *19/02*

U.S. Cl. 29—525 11 Claims



1. A process for driving an interference-fit fastener into a receiving aperture having a slightly smaller diameter than the fastener, comprising the steps of:

a. electromagnetically generating a stress wave having a high particle velocity;

b. conditioning the high velocity stress wave to control the intensity and length of the high velocity stress wave to provide an output stress wave which maintain a high stress level, the stress level of the conditioned stress wave being less than the yield stress of the interference-fit fastener to prevent plastic deformation thereof, the length of the stress wave being greater than the length of the interference-fit fastener; and

c. applying the conditioned high velocity stress wave to one end of thee interference-fit fastener causing a tensile elongation in the direction of propagation and contraction at right angles to the direction of propagation, the conditioned high velocity stress wave reflecting from the remote free end of the interference-fit fastener to impart a high velocity to the remote free end of the interference-fit fastener so that frictional forces are overcome and the interference-fit fastener is drawn into the receiving aperture.

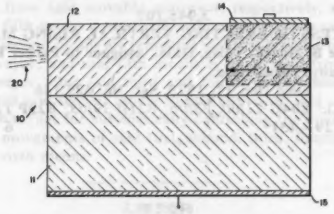
3,945,110
METHOD OF MAKING AN INTEGRATED OPTICAL DETECTOR

Robert G. Hunsperger, Malibu; Harold M. Stoll, Sierra Madre; Gregory L. Tangonan, and Amnon Yariv, both of Pasadena, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 390,836, Aug. 23, 1973, Pat. No. 3,873,828. This application Sept. 16, 1974, Ser. No. 506,498

Int. Cl.² H01L *21/02*

U.S. Cl. 29—572 5 Claims



1. In a process of fabricating an integrated optical device which includes the step of forming a light transmissive waveguide in a semiconductor substrate, the improvement comprising:

a. proton irradiating a selected portion of said waveguide to form an active photodetector region integral with said waveguide by creating optically active defeat centers in said region to thereby shift the effective wavelength absorption edge therein to render said photodetector region sensitive to light of wavelengths that can be transmitted through said waveguide; and

b. forming a Schottkey barrier diode type electrode on the proton irradiated region and an ohmic contact electrode on said substrate.

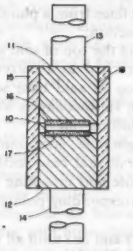
3,945,111
METALLIZATION SYSTEM FOR SEMICONDUCTOR DEVICES, DEVICES UTILIZING SUCH METALLIZATION SYSTEM AND METHOD FOR MAKING DEVICES AND METALLIZATION SYSTEM

Richard L. Greeson, Scottsdale, and Elliott M. Philofsky, Phoenix, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 430,431, Jan. 3, 1974. This application Oct. 16, 1974, Ser. No. 515,279

Int. Cl.² B01J *17/00*

U.S. Cl. 29—588 5 Claims



1. The method of making a semiconductor device including a semiconductor chip, at least one terminal metallurigically bonded to said chip and a glass sleeve sealed to said terminal comprising the steps of:

forming a semiconductor chip having a metallization system thereon comprising a layer of aluminum, a layer of aluminum and tin mixture on said aluminum layer;

providing at least one terminal consisting of one metal selected from the group of molybdenum, copper, nickel, silver, platinum, palladium, rhodium, tungsten, a copper clad steel and an alloy of nickel and cobalt in iron;

disposing said terminal adjacent said semiconductor chip;

providing a glass sleeve surrounding said terminal;

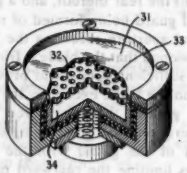
subjecting the assembly of said chip, said terminal and said glass sleeve to a time-temperature cycle comprising an increase in temperature to about 725°–825°C in about 6–10 minutes followed by a decrease in temperature to slightly below the aluminum-silicon eutectic in a period of about 10–30 seconds, and followed by a decrease in temperature to room temperature in about 5–7 minutes.

3,945,112

TECHNIQUE FOR FABRICATION OF FOIL ELECTRET

Harold Schonhorn, New Providence; Gerhard Martin Sessler, Summit, and James Edward West, Plainfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 21, 1975, Ser. No. 560,689
Int. Cl.² H01S 4/00
U.S. Cl. 29—592 **6 Claims**



1. Technique for the fabrication of a foil electret which comprises the steps of depositing a layer of gold on the surface of a perfluorinated foil and charging the non-gold coated face of said foil, the improvement which comprises depositing a thin film of a metal selected from the group consisting of aluminum and titanium on the surface of said foil and removing the thin film with a solvent prior to deposition of the gold layer.

3,945,113

METHOD FOR MANUFACTURING A CONNECTING CIRCUIT FOR AN INTEGRATED MINIATURISED WIRING SYSTEM

Michele Bonnel, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 26, 1974, Ser. No. 445,855
Claims priority, application France, Mar. 2, 1973, 73.07541
Int. Cl.² H05K 3/00
U.S. Cl. 29—625 **2 Claims**

1. A method for manufacturing a connecting circuit for an integrated miniaturised wiring system said circuit including conductors having one of their ends opened into a cavity in which said system is to incorporated, said method comprising depositing said conductors upon a first metal which is etchable by certain chemical agents, said conductors resisting said agents the etching of a part of said first metal and the replacing of said first metal which has been removed, by an insulating material in which said ends of said conductors are embedded said method further comprising the following stages:

a. first covering of the whole external surface of the device thus obtained with a thin layer of said first metal;

b. localising and depositing on said thin layer of a photosensitive resin mask, determined by the dimension of said cavity;

c. second covering of the whole of the device with the exception of the zone protected by said mask, with a thick layer of said first metal;

d. removal of said mask laying bare of said thin layer;

e. rapid etching by said chemical agents, of said thin layer and baring said insulating material at this location;

f. hollowing out of said insulating material thus bared, forming

said cavity in which at least one end of said conductors is opened into;

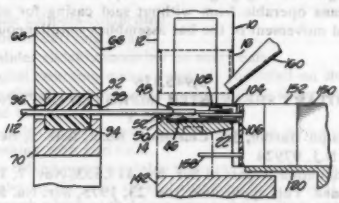
g. chemical etching by means of one of said chemical agents of the whole of said thick layer and of said first metal.

3,945,114

METHOD FOR THE SIMULTANEOUS TERMINATION IN TERMINAL SLEEVES OF A PLURALITY OF WIRES WITH A MULTI-PIN CONNECTOR

Dennis Carl Siden, Portolla Valley, and Corey John McMills, Los Altos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Feb. 14, 1974, Ser. No. 442,580
Int. Cl.² H02G 15/08
U.S. Cl. 29—628 **12 Claims**



1. A method for the termination of a plurality of wires to a plurality of conductive elements including the steps of

threading a plurality of wires through a plurality of terminal sleeves retained in fixed positions relative to one another;

cutting the ends of the wires extending from the terminal sleeves at a first distance from the terminal sleeves;

stripping a length of insulation from the ends of each of the wires extending from the terminal sleeves;

positioning the wires such that the stripped ends are capable of juxtaposition with individual elements to which they are to be terminated; and

sliding the terminal sleeves relative to said elements simultaneously on to said elements while maintaining the position of the wires relative to said elements to juxtapose selectively the stripped ends of the wires with said elements for the termination of the wires to said elements in terminal sleeves.

3,945,115

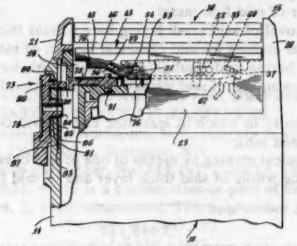
SKIN ENGAGING MEANS FOR AN ELECTRIC DRY SHAVER

John F. Daniels, Bridgeport; Maurice A. Melito, Jr., Milford, and Edward Szymansky, Fairfield, all of Conn., assignors to Sperry Rand Corporation, Bridgeport, Conn.

Filed June 14, 1974, Ser. No. 479,368
Int. Cl.² B26B 19/42
U.S. Cl. 30—34.2 **7 Claims**

1. In an electric dry shaver,

a. a casing having a cutter head assembly mounted thereon,
b. a pair of skin engaging bar assemblies mounted on said casing at opposite sides of said cutter head assembly and each including a drive bar having a drive arm extending therefrom, and a frame member having a portion arranged to engage the skin of the user in advance of the hair to be clipped by the cutter head,



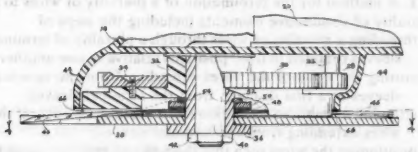
c. means mounting each of said bar assemblies for movement toward and away from the cutter head assembly, and
d. a control and drive means carried by said casing and including a bell crank pivotally mounted on said casing having drive lugs provided on each bell crank arm each in engagement with said drive arm of an adjacently arranged skin engaging bar assembly, said control and drive means operable from without said casing for effecting said movement of the bar assemblies simultaneously.

3,945,116

ROTARY SHEAR WITH IMPROVED CUTTING ASSEMBLY

John Ralph Hardin, Jr., Claremont Road, R.D. 1, Bernardsville, N.J. 07924

Continuation-in-part of Ser. No. 413,533, Nov. 7, 1973, abandoned. This application Jan. 23, 1975, Ser. No. 538,457
Int. Cl.² B26B *15/00*; A01G *3/06*
U.S. Cl. 30—206 **11 Claims**



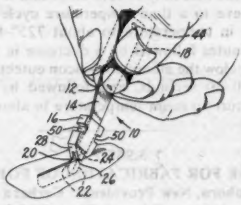
8. A rotary grass shear comprising a housing having an electric motor therein, said electric motor having an output rotary shaft, a stationary bed knife assembly secured to said housing, said stationary bed knife assembly including a stationary bed knife having a plurality of substantially radially extending teeth each of which has a lateral cutting edge and a lateral trailing edge formed thereon, a stationary shaft about which a rotary blade means driven by said electric motor is rotatable, said rotary blade means being in a floating relationship to said bed knife adapted such that the rotary blade means is able to rock in see-saw like fashion about said stationary shaft, said rotary blade means having finger means with lateral leading cutting edges formed thereon which are adapted to be contactable consecutively in a predetermined relationship with the lateral cutting edges and the lateral trailing edges to engage said lateral cutting edges at an inclined angle to a plane along which said lateral cutting edges extend to be shearable of grass and other growth in scissor-like fashion.

3,945,117

SURGICAL BLADE WITH ADJUSTABLE BLADE GUARD

John R. Beaver, Lexington, Mass., assignor to Rudolph Beaver, Inc., Belmont, Mass.

Continuation of Ser. No. 332,611, Feb. 15, 1973, abandoned. This application Sept. 18, 1974, Ser. No. 507,079
Int. Cl.² B26B *29/02*; A61B *17/32*
U.S. Cl. 30—287 **4 Claims**



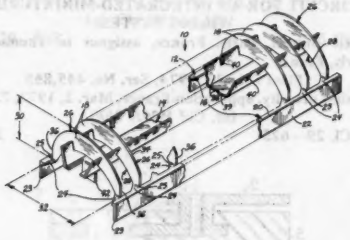
1. A knife assembly for making incisions of pre-determined limited depth, comprising a blade having a forward portion with a cutting edge formed on the side edge thereof, said portion having a width less than that of the portion of the blade immediately to the rear thereof, and a guard assembled onto the blade, said guard being formed of resilient material and having a central aperture receiving the forward portion and being so dimensioned that the blade is frictionally gripped by said guard with sufficient strength to prevent axial movement of the guard on the blade except by the application of a force substantially greater than the force applied thereto during a cutting operation, said blade being so gripped by the guard that contact of the guard with the cutting edge is avoided, and means limiting the rearward movement of the guard so that the only portion of the blade having a cutting edge can protrude therefrom.

3,945,118

SHAVER INNER CUTTER

Robert J. Tolmie, Fairfield, Conn., assignor to Sperry Rand Corporation, Bridgeport, Conn.

Division of Ser. No. 414,175, Nov. 8, 1973, Pat. No. 3,858,461. This application Nov. 7, 1974, Ser. No. 521,724
Int. Cl.² B26B *19/04*
U.S. Cl. 30—346.51 **6 Claims**



1. A landless inner cutter for an electric shaver, comprising:
a. an elongated body portion formed from a flat strip of metallic material, said body portion including a pair of oppositely spaced longitudinally extending side sections and a plurality of arch-shaped transversely extending blade sections, the side sections respectively including a plurality of equidistantly longitudinally and oppositely spaced ledges, said blade sections each spanning the space between said side sections and being supported

normal to said side sections by said oppositely disposed ledges;

b. each of said blade sections having outer and inner arch-shaped peripheral edges, said peripheral edges of each blade section being non-concentric to each other with the radius of the outer edge of one blade section being taken from the same center as the radius of the inner peripheral edge of the next succeeding blade section; and

c. means for securing said normally disposed blade sections parallel to one another.

3,945,119

VIBRATION ISOLATION DEVICE FOR HANDLES OF CHAIN SAW

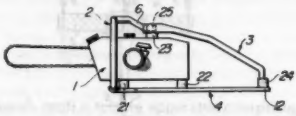
Akira Nagashima, Mitaka, and Hisashi Inaga, Tokyo, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed May 22, 1975, Ser. No. 580,040

Claims priority, application Japan, Jan. 28, 1975, 50-11527

Int. Cl.² B27B *17/02*

U.S. Cl. 30—383 **3 Claims**



1. In a gas chain saw, a combination comprising

a. an engine unit enclosing therein an engine, a fuel tank, an oil tank and a chain driving unit;

b. a front handle so arranged as to surround the upper portion and one side portion of said engine unit in spaced apart relation therewith;

c. a rear handle extended backwardly of said engine unit; and

d. a handle connecting member attached through vibration isolators made of an elastic material to the bottom portion of said engine unit and extended backwardly thereof,

the rear end of said handle connecting member being joined through a vibration isolator the rear end of said rear handle,

the front end of said rear handle being joined through a vibration isolator to the upper portion of said engine unit,

the upper end of said front handle being positioned in opposed relation with the upper end of said rear handle in the horizontal direction and joined together through a vibration isolator.

3,945,120

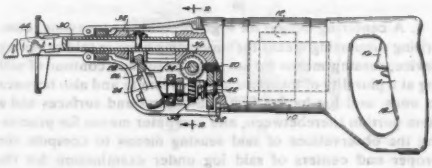
VIBRATION DAMPENING AND HEAT SINK MECHANISM FOR A RECIPROCATING POWER SAW

Alan J. Ritz, Brookfield, Wis., assignor to Milwaukee Electric Tool Corporation, Brookfield, Wis.

Filed Apr. 25, 1974, Ser. No. 571,545

Int. Cl.² B27B *11/02*

U.S. Cl. 30—393 **5 Claims**



1. A power saw comprising:

a. a casing;

b. a motor mounted in said casing having an output element;

c. a carrier guide mounted in said casing for relative axial movement said guide having a mass to cause it to act as a counterweight;

d. a saw blade carrier axially movable in said carrier guide; and

e. drive means connecting said output element to said carrier guide and said blade carrier to provide both with cooperatively controlled axial movement.

3,945,121

DEVICE FOR PREVENTING ERROR IN SLIDE CALIPERS

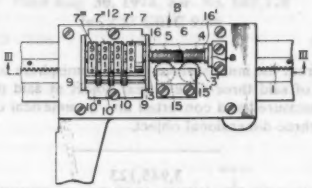
Kenju Uchino, Utsunomiya, Japan, assignor to Yehan Uchino, Yokohama, Japan

Filed Apr. 17, 1972, Ser. No. 244,459

Claims priority, application Japan, June 30, 1971, 46-57312[U]

Int. Cl.² G01B *5/02*

U.S. Cl. 33—147 T **3 Claims**



1. Slide calipers comprising:

a. a beam carrying a rack,

b. a slider slidably mounted on said beam,

c. digital counting means rotatably mounted on the slider for digitally indicating the position of the slider relative to said beam,

d. two driving gears rotatably mounted on said slider and meshing with said rack,

e. two driven gears rotatably mounted on said slider at right angles to the axes of said driving gears, helical glaring through which each driven gear is driven from one of said driving gears, one of said driven gears connected to drive said counting means, while the other driven gear is journalled in axial alignment with said one driven gear and with said counting means, and

f. resilient means rotationally biassing the two driven gears in opposite directions.

3,945,122

THREE DIMENSIONAL NUMERICAL SURFACE DESCRIPTOR

Philip E. Durand, Hudson; Lawrence R. McManus, Lynn, and William D. Claus, Jr., Natick, all of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

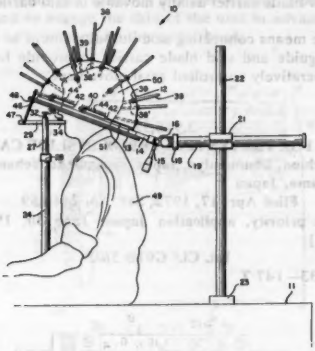
Filed Oct. 29, 1974, Ser. No. 518,929

Int. Cl.² G01B *5/20*

U.S. Cl. 33—174 D **3 Claims**

1. An apparatus for the measurement and numerical description of a three-dimensional object which comprises, a hollow, transparent hemisphere, said hemisphere being sufficiently large to accommodate said three-dimensional object therein with space remaining between the outer surface of said three-dimensional object and the inner surface of said hemisphere, a plurality of cylindrically shaped solid rod probes, each of said probes fitting snugly in a sleeve extending through and lockably and unlockably attached to the wall of said hemisphere so that said probe is adapted to be moved inwardly and outwardly of said hemisphere, and means for adjustably supporting and clamping said hemisphere in a plurality of selected positions in relation to said three-dimen-

sional object, whereby said probes may be moved inwardly of said hemisphere until they contact the outer surface of said three-dimensional object at a plurality of points and the distances from the inner surface of said hemisphere to the outer surface of said three-dimensional object at said plurality of points measured and converted into a numerical description of said three-dimensional object.



3,945,123

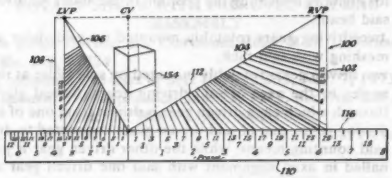
DEVICE FOR DRAWING OBJECTS IN PERSPECTIVE

Carl Tortorici, 3566 S. Lake Drive, Boynton Beach, Fla. 33435

Filed Nov. 29, 1974, Ser. No. 528,036

Int. Cl.² B43L *13/14*

U.S. Cl. 33—77 **3 Claims**



1. A device to aid a draftsman or the like for drawing objects in perspective comprising:

a planar body, said body having a substantially straight base edge, a substantially straight left upper surface edge, a substantially straight right upper surface edge, said left and right upper surface edges being joined together to form a pre-determined angle, said angle to be utilized in the drawing of a perspective figure, a left vertically disposed side edge, a right vertically disposed side edge, the upper end of said left upper surface edge forming a left vertex adjacent the upper end of said left side edge, the upper end of said right upper edge forming a right vertex adjacent the upper end of said right side, said left vertex representing a left vanishing point and said right vertex representing a right vanishing point, a first scale having a plurality of linearly spaced indicia disposed on said body adjacent the base edge of said body for use with the right upper edge and a second scale having a plurality of linearly spaced indicia disposed on said body adjacent the base edge of said body for use with said left upper surface edge, a third scale having a plurality of spaced indicia disposed on said body adjacent said right upper edge, said third scale indicia being determined by the intersection of a plurality of lines connecting said first scale indicia to a pre-determined point lying outside of said body and a fourth scale having a plurality of indicia disposed on said body adjacent said left upper edge, said fourth scale indicia being determined by the intersection of a plurality of lines connecting said second scale indicia to a single pre-determined point lying outside of said body.

3,945,124

CONTACT SENSOR FOR WORKPIECE CALIPERING

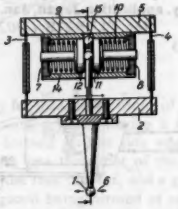
Hans-Dieter Jacoby, Werdorf, and Erich Schuster, Huttenberg, both of Germany, assignors to Ernst Leitz GmbH, Wetzlar, Germany

Filed Oct. 24, 1974, Ser. No. 517,643

Claims priority, application Germany, Nov. 9, 1973, 2356030

Int. Cl.² G01B *5/00, 5/20, 7/00*

U.S. Cl. 33—169 R **7 Claims**



1. In a sensor for calipering workpieces having at least two coordinate axes of measurement of translational motion and having one spring parallelogram for each of said coordinate axes, the improvement comprising at least one of said spring parallelograms having a given elasticity constant combined with additional spring means (9,10,13) for varying said elasticity constant of said one of said spring parallelograms as a function of the deflection of said sensor along the coordinate axis associated with said one spring parallelogram.

3,945,125

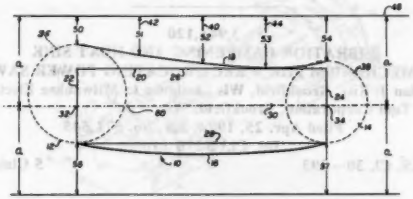
APPARATUS AND METHOD FOR CENTERING LOGS FOR VENEER PROCESSING

Thomas W. Mouat, Vancouver, Canada, and Philip Howard LeMasurier, New Fairfield, Conn., assignors to Weldwood of Canada Limited, Vancouver, Canada

Filed Apr. 27, 1970, Ser. No. 32,271

Int. Cl.² A61B *5/08*; B23F *23/08*

U.S. Cl. 33—174 R **11 Claims**

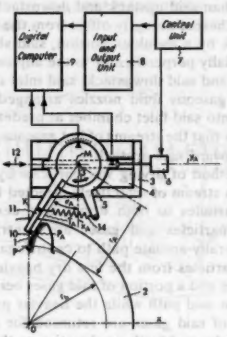


1. A centering device for logs for veneer processing, comprising supporting means for supporting a log in said centering device, sensing means for sensing the surface contour of said log at a plurality of locations along its length and also between its ends, said log having first and second end surfaces and a stem portion therebetween, and computer means for processing the observations of said sensing means to compute the proper end centers of said log under examination for the maximum dimension of the cylinder which can be obtained from said log in veneering operations.

3,945,126
GEAR TESTER

Peter Bloch, Mutschellen, Switzerland, assignor to Maag Gear-Wheel & Machine Company Limited, Zurich, Switzerland

Filed Sept. 13, 1974, Ser. No. 505,909
Int. Cl.² G01B 9/02
U.S. Cl. 33—179.5 R 7 Claims

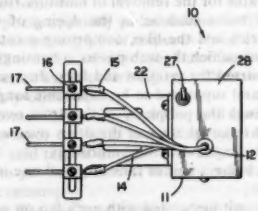


1. Gear tooth profile testing apparatus comprising a probe for engagement with a gear tooth flank, a first displaceable mounting on which the probe is securable and a second displaceable mounting on which said first mounting is supported, and a base on which said second mounting is supported, the first and second mountings having different directions of displacement, biassing means connected to at least one of said mountings for holding the probe against said tooth flank and driving means for displacement of one of said mountings and thereby for movement of the probe along said flank, respective measuring devices sensing the displacement of the two mountings for measuring respective components of the relative movement between the probe and the tooth flank, and means for transmitting respective series of measurement signals from said devices, one of said series of signals representing the relative movement between the two mountings with the tooth flank stationary and the other of said series of signals representing the movement of one of the mountings relative to a fixed point, comparison means receiving said measurement signals and means for supplying reference signal values to said comparison means, said comparison means determining the difference between the reference signal values and the actual signal values from the measuring devices.

3,945,127
SIGHTING APPARATUS

Phillip G. Spencer, R.R. No. 6, Box 994, Kokomo, Ind. 46901

Filed Mar. 27, 1974, Ser. No. 455,368
Int. Cl.² F41G 1/32
U.S. Cl. 33—265 11 Claims



1. A sighting device for use in combination with an archery bow comprising:

a. a source of energy, said energy source being provided with a toggle switch, said toggle switch being manually operable to turn said source of energy on or off;

b. a source of light, said light source being connected to said source of energy through said switch;

c. flexible means for conducting said light;

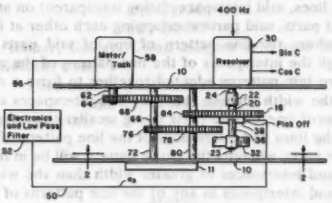
d. from about 1 to about 10 adjustable light receiving sighting pins, said sighting pins being connected to said means for conducting light, each of said sighting pins comprising a tubular member bent at a 90° angle;

e. means for mounting said sighting device to an archery bow, said mounting means being adapted to mount said sighting device for either a left handed or a right handed position.

3,945,128
DYNAMIC VERTICAL ANGLE SENSOR

Mitchell Weiss, Palos Verdes, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 30, 1974, Ser. No. 502,120
Int. Cl.² G01C 9/06
U.S. Cl. 33—366 5 Claims



1. A vertical angle sensor for sensing the angular position of a structure along a plane comprising:

sensor mounting means fixedly mounted to said structure;

a gear train rotatably mounted to said sensor mounting means and including first and second gears having respective first and second shafts, said first shaft having an axis orthogonal to said plane, said first gear having a vertical reference axis orthogonal to the axis of said shaft thereof;

vertical angle sensor means mounted on said first gear at a pivot point externally radial to an axis of said first gear means along said reference axis and including pendulum means rotatably mounted at said pivot point and said pendulum having a vertical axis;

servo motor means coupled to said second shaft for rotating the gears in said gear train;

servo control means coupled between said vertical angle sensor means and said servo motor means; and

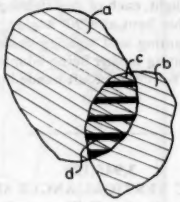
resolver means including stator means fixedly mounted to said sensor mounting means and rotor means fixedly mounted to said first shaft, whereby upon said vertical sensor means sensing an angle of movement of said reference axis of first gear means relative to said vertical axis of said pendulum means, said servo control means controls said servo motor means to rotate said first gear so that said reference axis moves to the vertical position with said rotor means moving with said first gear means and said stator means providing a signal representative of the angle of movement.

3,945,129

INSTRUMENT FOR THE INDICATION OR CHECKING OF THE ANGULAR POSITION OF AN OBJECT

Lars A. Bergkvist, Gottne, 890 26 Moliden, Sweden

Filed Nov. 13, 1974, Ser. No. 523,350
Int. Cl.² G01C 9/12
U.S. Cl. 33—399 8 Claims



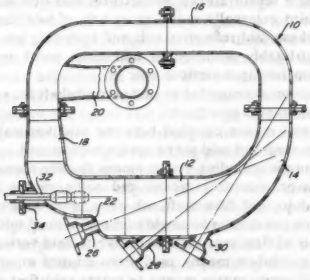
1. An instrument for indicating or checking the angular position of an object comprising, a stationary part and a movable part, said movable part being pivotally connected to said stationary part and rotatable about an axis which is not coincident with the mass center of the movable part, said stationary part having at least one straight edge for placement against a surface of said object, said stationary part and said movable part having a pattern of equally wide parallel lines, said lines being separated by interspaces of substantially the same width as the lines, said interspaces being transparent on at least one of said parts, said parts overlapping each other at least in an area where the line pattern of one of said parts is visible through the interspaces of the line pattern of the other part, the two line patterns adapted together to form a moire pattern, the width of both the lines and interspaces of the line pattern of one of said parts being smaller than the width of both the lines and interspaces of the line pattern of the other of said parts, whereby the moire pattern will be in the form of lines and interspaces of greater width than the width of the lines and interspaces in any of the line patterns of said parts such that the angular position of the lines and interspaces of said moire pattern provides a very accurate indication of the angular position of said object against which said edge is placed.

3,945,130

EXPANDED CHAMBER CENTRIFUGAL DRYING MILL

Nicholas N. Stephanoff, Haverford, Pa., assignor to Fluid Energy Processing & Equipment Co., Hatfield, Pa.

Filed Jan. 10, 1975, Ser. No. 540,136
Int. Cl.² F26B 3/08, 17/10
U.S. Cl. 34—10 12 Claims



1. A centrifugal drying mill for wet particles comprising a generally arcuate housing including an inlet chamber, an upstack connected to one end of said chamber, a classification section connected to said upstack and a downstack connected to said classification section, said downstack being connected to the opposite end of said chamber, an exhaust port leading from the inner periphery of said housing between said classification section and said downstack, and a feed inlet being positioned to project wet particles into said inlet chamber in the substantially axial direction of said inlet chamber, said inlet chamber having a substantially larger cross-sectional internal area than said upstack and downstack and having at least one wall thereof abruptly offset from the adjacent end of said downstack by a shoulder portion, said shoulder portion being substantially perpendicular to the adjacent walls of said inlet chamber and said downstack, said inlet chamber having a plurality of gaseous fluid nozzles arranged to propel hot gaseous fluid into said inlet chamber at predetermined angles in such manner that the streams of hot gaseous fluid therefrom are directed toward said upstack.

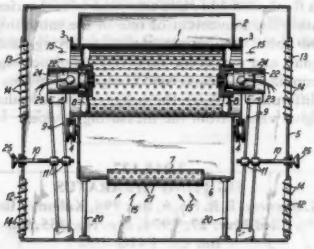
8. In the method of drying wet particles by propelling the particles into a stream of selectively directed hot gases which subject the particles to both drying and centrifugal action whereby the particles and gases are centrifugally moved through a generally arcuate path to centrifugally separate the drier lighter particles from the less dry heavier particles, the lighter particles and a portion of said gases being centrifugally exhausted from said path while the heavier particles and another portion of said gases are returned for admixture with fresh wet particles and further subjection to the hot gases, the improvement which comprises applying a back pressure to the particles to decelerate the centrifugal movement of said particles and rotate them, prior to their subjection to the hot gases while simultaneously moving said particles into said arcuate path.

3,945,131

WEB DRYING APPARATUS

Eduard Küsters, and Kurt Quoos, both of Krefeld, Germany, assignors to Eduard Kusters, Krefeld, Germany

Continuation of Ser. No. 36,851, May 13, 1970, abandoned.
This application Nov. 7, 1974, Ser. No. 521,857
Int. Cl.² F26B 11/02
U.S. Cl. 34—122 10 Claims



1. In apparatus for the removal of moisture from air permeable material webs such as in the dyeing of dyed fabrics, finished facbrics and the like, comprising a rotating foraminous drum over which the web passes, a housing in which said drum is supported for rotation and fans, disposed in the end of the drum and supported to be adjustable longitudinally, to draw air through the periphery of the drum over a predetermined circumferential zone of the drum over which the web is running, the improvement comprising:

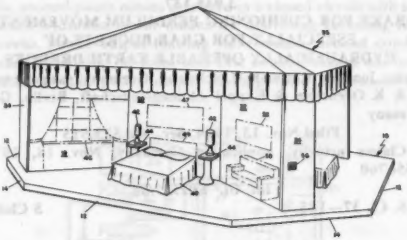
a. the fans being a pair of fans disposed one in each end of the drum;

b. a motor unit associated with each fan on which said fan is mounted; and

c. actuation means for inserting said motor units and fans into the drum and withdrawing them therefrom to adjust

the length of the zone over which the air is drawn through the web.

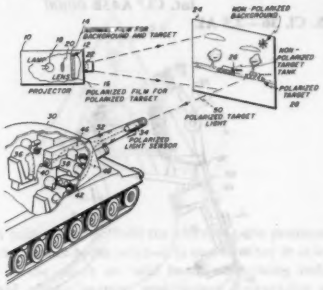
3,945,132
DISPLAY SYSTEM
David M. Parmelee, Vantage Point, Spring Lake, Mich. 49456
Filed Sept. 27, 1974, Ser. No. 510,060
Int. Cl.² G09B 25/00
U.S. Cl. 35—60 **3 Claims**



1. A display module including a plurality of adjacent angularly related display units, each display unit including a supporting floor for receiving an article to be displayed, said supporting floor for said display units comprising a platform, a back projection screen positioned on the floor adjacent the rear of said floor, and a pair of side projection screens positioned adjacent opposite ends of said back screen and extending outwardly at an angle to said back screen to define the sides of the display unit, said side screens supported in spaced relationship to adjacent side screens of an adjacent display unit and coupled thereto for support, said side screens of adjacent display units being generally parallel to one another, said platform comprises an eight-sided platform with alternate sides of equal width and wider than the remaining sides, wherein said alternate sides define the front of each display unit and wherein said back screens extend parallel to said alternate edges and said side screens extend orthogonally to said remaining sides.

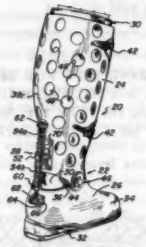
3,945,133
WEAPONS TRAINING SIMULATOR UTILIZING POLARIZED LIGHT
Windell N. Mohon, Winter Park; George Derderian, Maitland, and Denis R. Breglia, Altamonte Springs, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed June 20, 1975, Ser. No. 588,738
Int. Cl.² F41G 3/26
U.S. Cl. 35—25 **8 Claims**

1. A polarizing type gunnery training simulator comprising
a. a projector;
b. a composite specially polarized movie film for said projector comprising layers respectively of normal non-polarized film taken of a scene including background and target areas and a polarizing type film taken of the target area only of the scene;
c. said normal film having recorded said entire scene during the daytime, and said polarizing type film having recorded said targets at night with only said targets illuminated to provide a film of linearly polarized target areas upon exposure;
d. a non-polarizing screen upon which to display, via said projector, the unpolarized entire scene and the linearly polarized target area of said scene; and
e. a polarized light sensor unit and means for attaching said unit to a weapon to provide hit indication when said weapon is aimed at said polarized target area, and no hit



indication when said weapon is aimed at said non-polarized background scene.

3,945,134
SKI BOOT
Paul C. Ramer, Golden, Colo., assignor to Alpine Research, Inc., Golden, Colo.
Filed Sept. 13, 1974, Ser. No. 505,632
Int. Cl.² A43B 00/00
U.S. Cl. 36—2.5 AL **19 Claims**

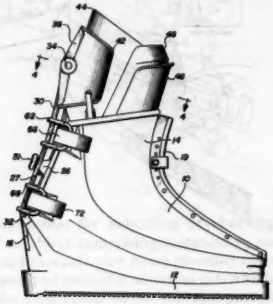


1. A ski boot comprising in combination:
an upper having a foot portion and leg portion, said leg portion adapted to extend along the calf portion of a user's leg.
pivot means interconnecting the foot portion to the leg portion whereby the leg portion is pivotal about a generally horizontal axis passing transversely of the foot portion,
a connection unit interconnecting the foot portion and leg portion, said connection unit having double acting resilient means therein for cushioning both forward and rearward pivotal movement of the leg portion relative to the foot portion and,
a removable sock portion adapted to be slid into and out of the upper, said sock portion having a water-repellant outer covering and a core of at least partially reticulated plastic material.

3,945,135
SKI BOOT

Alden B. Hanson, and Chris A. Hanson, both of Boulder, Colo., assignors to Hanson Industries Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 450,547, March 13, 1974, abandoned. This application Nov. 18, 1974, Ser. No. 524,720
Int. Cl.² A43B 00/00
U.S. Cl. 36—2.5 AL 22 Claims

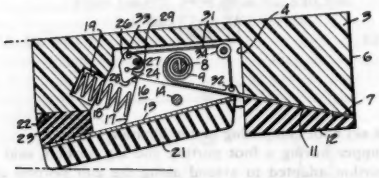


1. A ski boot comprising:
a sole having a semi-rigid vamp attached thereto, said vamp having a rear opening;
a rigid beam member, positioned to the rear of said opening, said beam member being connected to said boot and being horizontally pivoted at one of its two ends on a lateral axis contiguous to the lowermost portion of said opening;
closure means adapted to fix said beam member with respect to said semi-rigid vamp; and
cuff assembly means pivotally attached to said beam contiguous to the remaining beam end, said cuff means being adapted to support the back and sides of the leg of a person wearing said ski boot.

3,945,136
SPRING LIFT FOR SHOES

Bonny B. Koo, P.O. Box 503, Pacific Grove, Calif. 93950

Filed Feb. 10, 1975, Ser. No. 548,381
Int. Cl.² A43B 21/30
U.S. Cl. 36—38 8 Claims

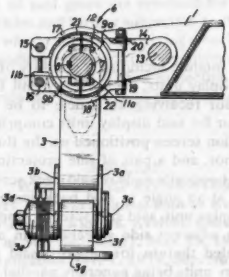


1. A lifting device for a heel, having a bottom,
a first movable heel portion on said bottom,
a second movable heel portion on said bottom,
said heel portions complementing the bottom of the heel,
first resilient mounting means related to said first movable heel portion biased to urge said first movable heel portion away from said bottom thereby to aid the lifting of the heel,
second resilient mounting means related to said second movable heel portion and related to said first movable heel portion so as to initially urge said second movable heel portion to resist the bias of said first resilient mounting means and to urge said first movable heel portion toward said bottom,
latching means on said heel actuated by movement of said second movable heel portion under pressure of weight on the heel so as to render said second resilient mount means inoperative,
and releasing means on said heel actuated by the downward movement of said first heel portion to release said latching means, thereby to release said second resilient means for urging said first heel portion toward said bottom.

3,945,137
BRAKE FOR CUSHIONING PENDULUM MOVEMENTS, ESPECIALLY FOR GRAB BUCKETS OF HYDRAULICALLY OPERABLE EARTH DREDGES

Heinz Joachim Rüttershoff, Schwelm, Germany, assignor to O & K Orenstein & Koppel Aktiengesellschaft, Berlin, Germany

Filed Nov. 13, 1974, Ser. No. 523,515
Claims priority, application Germany, Nov. 14, 1973, 2356760
Int. Cl.² E02F 5/06
U.S. Cl. 37—183 R 5 Claims



1. In combination with a dredge having shank forming means with a free end thereof, bearing means forming bearing supported by said free end, and a bolt rotatably journaled in said bearing means; a pendulum brake which includes: a grab bucket holder non-rotatably connected to said bolt, brake drum means likewise non-rotatably connected to said bolt, two clamping arms embracing said drum means and provided with brake lining means for frictional engagement with said drum means, and adjustable means associated with said clamping arms and operable to adjust said arms relative to said drum for causing said lining means to exert a desired pressure upon said drum means.

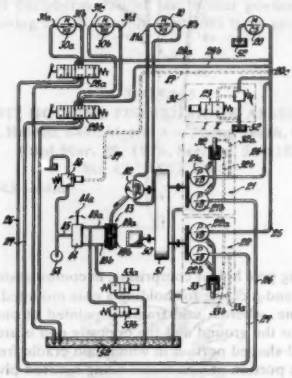
3,945,138
HYDRAULICALLY CONTROLLED AND DRIVEN BUCKET WHEEL DREDGE

Helmut Heusler, Dortmund-Kirchhorde; Günther Alpers, Dortmund-Kirchlinde, and Jürgen Gerber, Ergste, all of Germany, assignors to Orenstein & Koppel Aktiengesellschaft, Berlin, Germany

Continuation-in-part of Ser. No. 371,135, June 18, 1973, abandoned. This application Mar. 27, 1975, Ser. No. 562,545
Claims priority, application Germany, June 16, 1972, 2229347
Int. Cl.² E02F 3/88
U.S. Cl. 37—190 6 Claims

1. A hydraulically controlled and driven dredge governed directly by working pressure which includes: a bucket wheel, track laying means, a lower structure supported by said track laying means, an upper structure supported by said lower structure and pivotable about a vertical axis relative to said lower structure, a boom pivotable in a vertical plane and

supported by said upper structure and supporting said bucket wheel, first hydraulic motor means drivingly connected to said bucket wheel for driving the same, first pump means for delivering actuating fluid to said first hydraulic motor means, actuating fluid conveying first conduit means leading from said first pump means to said first hydraulic motor means, power control means responsive to changes in the digging resistance encountered by said bucket wheel and operatively connected to said first pump means for varying the delivery thereof in conformity with said varying digging resistance of said bucket wheel, second hydraulic motor means operatively connected to said upper structure for pivoting the same about its vertical axis, second pump means arranged in a closed circuit with said second hydraulic motor means for delivering actuating fluid thereto, power output limiting valve means, second conduit means branching off from said first conduit means and connected to said power output limiting valve means, control



circuit means including an adjusting unit and manually adjustable control means hydraulically connected to said adjusting unit by said control circuit means, said control circuit means hydraulically communicating with said power output limiting valve means, third hydraulic motor means drivingly connected to said track laying means for driving the same, third hydraulic pump means, third conduit means connecting said third hydraulic pump means to said third hydraulic motor means, additional valve means interposed in said third conduit means, and fourth conduit means connected to said additional valve means and leading to said first hydraulic motor means, said additional valve means being operable selectively to interrupt the supply of actuating fluid from said third pump means to said third hydraulic motor means when said track laying means is not to be operated and to convey the delivery from said third pump means to said first hydraulic motor means through said fourth conduit means.

3,945,139

ADVERTISING DEVICE

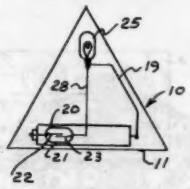
Robert A. Miller, 142 Harbor View, Lake St. Louis, Mo. 63367

Continuation-in-part of Ser. No. 442,735, Feb. 15, 1974, abandoned. This application July 24, 1975, Ser. No. 598,696

Int. Cl.² G09F *13/00*

U.S. Cl. 40—130 R **3 Claims**

1. An advertising device comprising a base and a manipulable display piece, said base having a clearly delineated supporting surface and a magnet concealed beneath said surface, said magnet having a pole eccentrically positioned with respect to the center of said delineated supporting surface, and said display piece having a lamp, an electric battery and a reed switch all connected in series with one another and all totally encapsulated within a solid plastic matrix, the outer surface of which is uninterrupted, said reed switch having an envelope and contact reeds within said envelope and movable with respect to one another in response to the presence of a magnetic field at said magnet pole, said reed switch being positioned within said piece to be physically isolated from said base surface when said piece is resting on said surface but to



be exposed to said magnetic field for changing the position of the reed switch contact reeds relative to one another in at least one position of the piece on said base, advertising indicia carried by said plastic matrix, and means comprising said advertising indicia for concealing from sight at least said electric battery and reed switch.

3,945,140

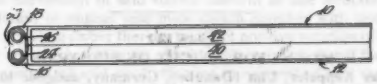
CARD BOOK

James Patrick Sullivan, 1752 Brookshire Ave., Tustin, Calif. 92680, and Dale D. Smith, 19391 Devry Drive, Irvine, Calif. 92664

Filed Nov. 18, 1974, Ser. No. 524,579

Int. Cl.² G09F *11/06*

U.S. Cl. 40—102 **6 Claims**



1. A card book comprising a pair of rigid covers, means for holding a plurality of cards on a surface of at least one of said covers, and hinge means for connecting said covers along one respective adjacent edge thereof, said hinge means comprising a plurality of spaced apart apertured struts secured to and extending from each of said respective edges of said covers, a pair of cylindrical rigid posts supported within said struts on said respective cover edges, said posts being disposed in the apertures of said struts in a spaced relationship from said respective edges, means for retaining said posts in said strut apertures, and a plurality of integral cylindrical double barrel members, each barrel of each said member having a longitudinal cylindrical aperture, the apertures of each said member being arranged in parallel and being disposed around the posts of respective covers with said members positioned between opposite corresponding pairs of struts thereof, whereby one of said covers can rotate completely around the other of said covers.

3,945,141

TRANSPARENT CARRIER SHEET CARRYING TRANSFERABLE INDICIA AND REFERENCE TRANSFERABLE GUIDE MARKS AND METHOD OF UTILIZING THE SAME FOR SIGN-MAKING

William B. Frost, 1717 - 99th NE., Bellevue, Wash. 98004

Filed Oct. 29, 1974, Ser. No. 518,403

Int. Cl.² B44C *1/00*

U.S. Cl. 40—125 A **20 Claims**

1. In a transparent carrier sheet carrying a plurality of rows of underlaid indicia transferable to a receiving surface by rubbing the exposed surface of the carrier sheet over the indicia to be transferred, the improvement comprising such indicia including at least one descending lower case letter, and

reference marks and underlaid transferable guide marks carried by the carrier sheet, said guide marks being transferable to a receiving surface by rubbing the exposed surface of the carrier sheet over said guide marks, said reference marks and transferable guide marks being arranged on the carrier sheet along a plurality of horizontal lines, each line including both

reference marks and transferable guide marks, each line being located the same distance below the row of indicia next above it as another line is located below the row of indicia next above such other line, and the line next below the row of indicia containing a descending lower case letter being below the downwardly projecting portion of such descending lower case letter.

3,945,142

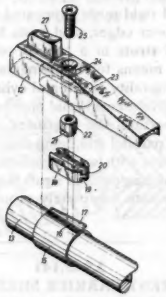
MOUNT FOR A SIGHT ON FIREARMS

Dieter Keppeler, Ulm (Danube), Germany, assignor to Carl Walther, Sportwaffenfabrik, Ulm (Danube), Germany

Filed Aug. 2, 1974, Ser. No. 494,069

Int. Cl.² F41G 11/00

U.S. Cl. 42—1 S **6 Claims**



1. In a mounting of a sight on a barrel of a firearm, the combination of an open ring having spaced ends and positioned around the barrel, a fastening element mounted on said ring spaced ends, a nut retained on said fastening element, a mount for a sight positioned over said nut and fastening element, and a screw passing through said mount and threaded into said nut so that tightening of the screw will draw said fastening element and nut upwardly to tighten said ring around the barrel.

3,945,143

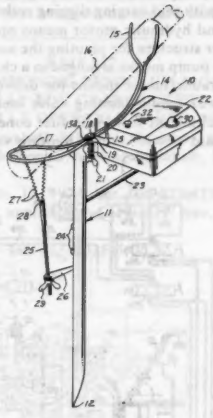
FISHING POLE HOLDER

Anthony S. Schmitt, Sr., 4125 Springdale, St. Louis, Mo. 63134

Filed Feb. 14, 1975, Ser. No. 549,906

Int. Cl.² A01K 97/12

U.S. Cl. 43—17 **2 Claims**



1. A fishing pole holder comprising, in combination, a frame for support and a cradle for holding a pole mounted rockably on said frame, wherein said frame is pointed at one end for insertion into the ground and the opposite end is arcuate and includes a U-shaped portion in which said cradle freely rides, said arcuate portion of said frame being secured pivotably to said cradle which is arcurate in configuration for said rocking movement there-between.

3,945,144

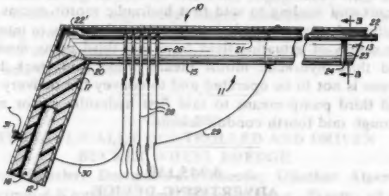
TROTLINE FISHHOOK HOLDER AND DISPENSER

Audie C. Purselley, 1507 E. Main St., Mesa, Ariz. 85203

Filed Apr. 14, 1975, Ser. No. 567,511

Int. Cl.² A01K 97/06

U.S. Cl. 43—54.5 A **6 Claims**



1. A tubular fishhook holding and dispensing device for a trotline having spaced stringers with each stringer having a fishhook composed of a shank portion, a bend portion and a barb, said device comprising:

a handle portion and a holder portion,

said handle portion and said holder portion being interconnected in an end to end arrangement forming generally an L-shaped configuration,

said holder portion being hollow and having a slit extending from its free end toward said interconnected end and having a rod with an offset end positioned therein, said rod being secured at its offset end to the inside periphery of said holder portion adjacent said handle portion,

said rod extending coextensive with said holder portion and outwardly a predetermined distance from its free end,

said rod being spaced from one portion of the inner peripheral wall of said holder portion by its offset end a distance slightly greater than the diameter of the fishhooks, whereby the fishhooks may be slid over the free end of said rod with their shanks extending through said slit of said holder portion for movement in an orderly manner toward the interconnected ends of said handle portion and said holder portion,

a guide means attached to said rod at its free end to extend laterally thereof within said holder portion, and

an opening in said holder portion at a point substantially diagonally opposite from said one portion of said inner peripheral wall of said holder portion for receiving said guide means,

said guide means moving through said opening when said rod is deflected from adjacent said one portion of said inner peripheral wall of said holder portion for readily receiving and dispensing fishhooks from said device.

3,945,145

BAIT HOLDING FISHING HOOK ASSEMBLY

Arnold I. Holden, 6490 Myrtle Ave., Long Beach, Calif. 90805

Filed Mar. 20, 1975, Ser. No. 560,183
Int. Cl.² A01K *83/06*
U.S. Cl. 43—44.6 **4 Claims**

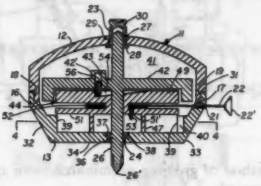
1. A bait holding assembly comprising in combination, a swivel means having a line connecting end and a tackle connecting end; a clip means having a front end and a rearward end, said front end thereof being connected to said swivel means; a bait holding clamping means comprising a pair of finger actuated clamping jaws interconnected by a spring biasing the leading edges of said jaws into clamping engagement, the opposite ends of said jaws being spaced for subsequent finger manipulation toward each other against the bias of said spring for spacing said forward ends for inserting or removing the bait; at least one of said jaws having an opening in said opposite end thereof receiving the rearward end of said clip means; said clamping jaws being of a width to clamp onto a substantial portion of an opened bivalve bait piece for holding and maintaining said bivalve in such opened position, the interior walls of said clamping jaws being concavely curved and including side wall portions which extend generally perpendicular to said curved walls and which are spaced to form a gap when the clamping jaws are closed under the bias of said spring, the concavely curved walls and said sidewall portions defining a generally enclosed area for receiving said bivalve, with substantially the entire clamping force of said jaws being transmitted to the bait through said leading edges, and a plurality of relatively short fishing lines having loop ends attached to said clip means and a hook end each of which has attached thereto a fishing hook which can be embedded in said bivalve bait.

3,945,146

GYROSCOPIC TOP

Paul L. Brown, 982 Lakeview Way, Redwood City, Calif. 94062

Filed Jan. 10, 1975, Ser. No. 540,131
Int. Cl.² A63H *1/04*
U.S. Cl. 46—50 **5 Claims**



1. A gyroscopic top comprising a hollow casing, a starter element mounted for oscillation within said casing, a coil spring connected to and wound about said starter element and connected to said casing, a male clutch member on said starter element, a starter cord having a portion thereof pre-wound on said starter element and having a finger-grip portion thereof projecting outside of said casing, a vertically arranged shaft mounted for rotation in said casing, said shaft having a spinning tip thereon, a rotor on said shaft, and a female clutch member on said rotor; exertion of an outward pulling force on said finger-grip portion of said starter cord effecting the unwinding of pre-wound portion of said cord and the simultaneous movement of said starter element in one direction of oscillation to engage said male clutch member with said female clutch member thereby to effect positive rotation of said rotor and the spinning tip of said shaft, release of said finger-grip portion of said cord effecting movement of said starter element in the opposite direction of oscillation to return the same to its initial position under the influence of said coil spring and the simultaneous re-winding of said portion of said starter cord on said starter element for subsequent activation.

3,945,147

HAND LAUNCH GLIDER

Thomas T. Crowder, 2849 E. Great Smoky Ct., Westlake Village, Calif. 91360

Filed Dec. 18, 1974, Ser. No. 533,875
Int. Cl.² A63H *27/00*
U.S. Cl. 46—76 R **10 Claims**

1. A hand launch glider comprising:

a fuselage having a longitudinal axis parallel to the direction of flight;

a wing connected by first connecting means to said fuselage;

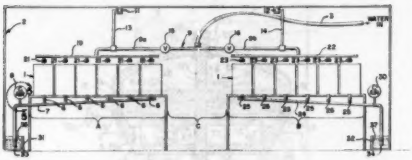
an empennage connected by second connecting means to said fuselage; and

said fuselage being constructed of thin, rigid self-supporting layers of plastic and a thin wood panel with the plastic bonded on opposite sides of the thin wood panel, the grain of said thin wood panel running parallel to said longitudinal axis of the fuselage, said plastic layers being substantially identical in thickness.

3,945,148
METHOD AND APPARATUS FOR GROWING BEAN SPROUTS

George Clem Oyama, 9, Shiba, Nishikubo, Shiroyama-cho, Minato, Tokyo, Japan

Filed Mar. 10, 1975, Ser. No. 556,629
Int. Cl.[2] A01G 9/02
U.S. Cl. 47—14 15 Claims



1. A method of growing germinated bean sprouts comprising the steps of:

a. placing a quantity of germinated beans to a uniform depth in a container having substantially vertical side walls, an open top, a drain opening in the bottom wall and the bottom wall having a gently sloping floor in the direction of the drain;

b. placing over said beans a substantially opaque relatively rigid cover having a plurality of openings adapted for admitting water and air therethrough and slideably mounted in said container to rise with the growth of said sprouts;

c. periodically introducing a pre-selected amount of water onto said cover for distribution thereby onto said beans;

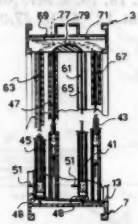
d. draining the water immediately from said beans through said drain opening; and

e. periodically flowing air through said growing bean sprouts at a selected pressure which will not disturb the orientation of said sprouts, in a direction opposite to the flow of water through said container, and after each introduction of water for a pre-selected duration until there is a substantial change of air within the container.

3,945,149
WINDOW CONSTRUCTION

Claude Boucher, 6900 Boulevard Gouin, West, Montreal, Quebec, Canada

Filed Aug. 27, 1974, Ser. No. 500,949
Int. Cl.[2] E05F 17/00
U.S. Cl. 49—121 3 Claims

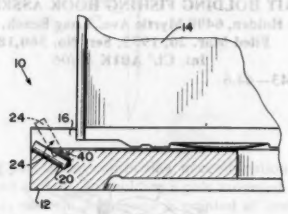


1. A double window construction comprising a frame, an inner and an outer window, the frame having jamb portions with pairs of mutually facing longitudinal channel members secured therein, each channel member having a U-shaped cross-section and lips directed toward each other and forming a mouth on the open side of the channel member, each window including an upper and a lower sashless glass pane, each slidable in a vertical direction along the two channel members of a corresponding pair of channel members, an elongated sealing member secured lengthwise against the bottom edge of each sashless pane, rod sections fixedly mounted in the sealing members and extending lengthwise of the latter, and laterally projecting outwardly at the opposite side edges respectively of each sashless glass pane and into the corresponding two channel members respectively through the mouth thereof, a hook member vertically displaceable in each channel member and operatively supporting the corresponding rod section of the associated glass pane, a first pair of flexible elongated members supported in the frame and connected at opposite ends to the hook members of the lower pane of one window and the upper pane of the other window, and a second pair of flexible elongated members supported in the frame and connected at opposite ends to the hook members of the lower pane of the other window and the upper pane of the one window, whereby to support the panes in counterbalanced manner.

3,945,150
RUNNERHEAD FOR A THROWING WHEEL

Wilbur Ripple Beckner, Waynesboro, Pa., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Jan. 20, 1975, Ser. No. 542,327
Int. Cl.[2] B24C 5/06
U.S. Cl. 51—9 R 4 Claims



1. A runnerhead for a throwing wheel, said runnerhead comprising a plate member having a face and at least one vane receiving channel formed in said face for receiving a throwing vane, and locking means for locking said throwing vane in said vane receiving channel, said locking means including a locking pin hole for receiving a locking pin, said locking pin hole having an axis and being formed in said plate member and extending along said axis angularly inwardly from said face; the improvement comprising a locking pin release channel means formed in said plate member contiguous with said locking pine hole and spanning said locking pin hole for allowing a locking pin to be removed from said locking pin hole in a direction other than along said axis.

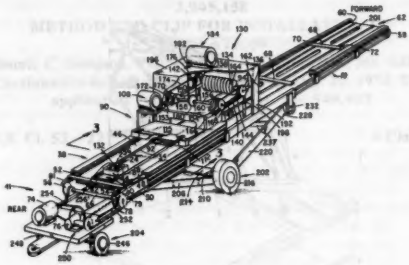
3,945,151
APPARATUS FOR REMOVING MORTAR FROM USED BRICK

Orville Lee Cook, Rte. 3, Strawberry Plains, Tenn. 37871

Filed Sept. 6, 1974, Ser. No. 500,250
Int. Cl.[2] B28D 1/00
U.S. Cl. 51—26 4 Claims

1. Apparatus for removing mortar from opposite flat surfaces of used brick comprising, in combination, elongated planar means defining a path supporting said brick on one of its flat faces thereon for forward movement along said path, means adapted to advance said brick forwardly along said path including a pair of loop members drivingly connected for synchronous movement along paths substantially parallel to the forward path of said brick and including an elongated cross member connected at its opposite ends to said loop members and extending therebetween and engaging said brick during such forward movement, means adapted to elevate said cross member to a vertical height above said planar means a distance approximately equal to one-half the nominal thickness of a brick, said means comprising a pair of substantially parallel and spaced apart elongated guides disposed on said

planar means and having upper surfaces on which said cross member rides, a first grinding station disposed at a location along the length of said path, said first grinding station comprising a first abrasive roll means having its rotational axis disposed generally transversely of the forward direction of movement of said brick, said rotational axis being disposed on the underside of said planar member such that a portion of the abrasive surface of said first abrasive roll projects above the upper surface of said planar member in position to abrasively contact the bottom surface of a brick moved along said path, relatively nonabrasive means overlying the path of said brick at a location adjacent said first abrasive roll means and resiliently biased toward engagement with the top face of said brick to urge its bottom face toward engagement with that portion of said first abrasive roll means that projects above the top surface of said planar member as said brick passes between said first roll means and said relatively nonabrasive means, a second grinding station disposed along the length of said path and spaced apart from said first grinding station, said second grinding station comprising a second abrasive roll means having its rotational axis disposed generally transversely of the forward direction of movement of said brick and above said planar member for passage of said brick between said second abrasive roll means and said planar member during forward movement of said brick with its previously ground bottom face disposed on said planar member, whereby said second abrasive roll means functions to remove mortar from the top face of said brick, and means mounting said second abrasive roll means for generally vertical movement thereof with respect to the forward path of said brick and resiliently biasing said second abrasive roll means downwardly toward said planar member.



3,945,152

RAIL HEAD RE-FORM GRINDING MACHINE

Heinrich Helgemeir, Allmannshausenerstr. 30, 8 Munich 70, Germany

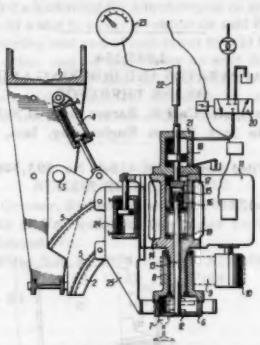
Filed Mar. 5, 1975, Ser. No. 555,364

Claims priority, application Germany, Mar. 6, 1974, 2410564

Int. Cl.² B24B *23/00*

U.S. Cl. 51—178 **8 Claims**

1. Rail Head Re-Form Grinding Machine with rotating grinding wheel operating at the front end, through the center of which a feeler device is provided immediately within the grinding border of the grinding wheel and connected to an indicating device, marked by the feeler device being an even plate (12) filling out almost the clear width of the grinding wheel (6) and being affixed pivoting at an axially adjustable axle (13), furthermore by the feeler device being adjustable



by means of pressure (18) and the adjusting distance which can be registrated via an indication device (22, 23).

3,945,153

GRINDING MACHINE WITH TILTED CONVEYOR AND CONVEYOR CLEARING MEANS

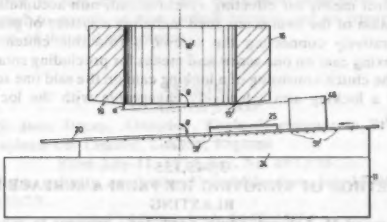
David Godfrey Williams, Wirral, England, assignor to C.E.S. (Grinding Machines) Limited, England

Continuation-in-part of Ser. No. 172,479, Aug. 17, 1971, Pat. No. 3,805,456. This application Apr. 19, 1974, Ser. No. 462,529

Claims priority, application United Kingdom, Aug. 28, 1970, 41474/70

Int. Cl.² B24B *7/02*; B65G *45/00*

U.S. Cl. 51—110 **9 Claims**



1. In a machine which includes an endless conveyer belt having upper and lower runs, and a support extending between said upper and lower runs and having an upper surface engaging a lower surface of said upper run to support the latter for sliding movement along said upper surface of said support, and means situated at said upper surface of said support for cleaning the lower surface of said upper run of said belt and for preventing undesired separation of said lower surface of said upper run from said upper surface of said support, the machine being a grinding machine and including a rotary grinding wheel situated over said upper run of said belt for grinding workpieces conveyed by said belt past said grinding wheel between said upper run of said belt and said grinding wheel, said grinding wheel having a lower tapered grinding surface of circular configuration provided with inner and outer peripheries and situated with its inner periphery closer to said belt than at its outer periphery, said surface of said support which engages said lower surface of said upper run of said belt and said upper run of said belt therewith being inclined at least slightly with respect to the axis of the grinding wheel, at an angle other than a right angle, for conveying the workpieces downwardly with respect to the grinding wheel so

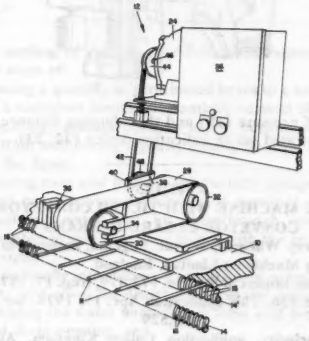
that when the grinding is completed at one side of the inner periphery of the grinding wheel the workpieces will clear the grinding wheel at an opposite side of the inner periphery thereof.

3,945,154

GRINDING APPARATUS AND INDEXING AND CONTROL MEANS THEREFOR

John O. Barnes, and Carl K. Barnes, both of Suffield, Conn., assignors to Jack Barnes Engineering, Inc., Hazardville, Conn.

Filed Sept. 5, 1974, Ser. No. 503,346
Int. Cl.² B24B *21/00*
U.S. Cl. 51—137 2 Claims



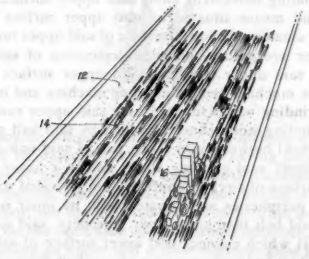
1. Grinding apparatus comprising: a plurality of spaced belt grinders, a twin screw feed for conveying work resting in the helical grooves thereof past the grinders, and indexing and control means for effecting synchronized, non-accumulative rotation of the twin-screw feed including a system of gearing operatively connecting the screws, a rotatable clutch and indexing cam on one screw and means for precluding rotation of the clutch consisting of a locking cam on the said one screw and a locking arm selectively engageable with the locking cam.

3,945,155

METHOD OF REMOVING ICE FROM A SURFACE BY BLASTING

Raymond M. Lellaert, South Bend, Ind., assignor to Wheelabrator-Frye, Inc., Mishawaka, Ind.

Filed Jan. 14, 1974, Ser. No. 433,067
Int. Cl.² B24C *1/00*
U.S. Cl. 51—319 6 Claims



1. A method for removing ice from a surface comprising the steps of:

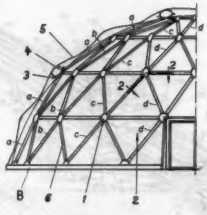
a. selecting a particulate material according to the physical characteristics of the ice to be removed;
b. Projecting the selected material onto the ice with kinetic energy sufficient to fragment the ice;
c. recovering the particulate material;
d. removing the ice fragments from the surface; and
e. removing contaminants from the particulate material.

3,945,156

INFLATABLE BUILDING CONSTRUCTION

Wilfried Hamm, Lutherstrasse 33, 4330 Mulheim (Ruhr), Germany

Filed May 30, 1974, Ser. No. 474,371
Claims priority, application Germany, June 6, 1973, 2328691
Int. Cl.² E04B *1/34, 1/347*
U.S. Cl. 52—2 2 Claims



1. A building construction including a lattice-like network of support elements connected together at junctures to form a three-dimensional frame for the support of a fabric-like canopy laid thereover as an enclosure which is secured along its bottom edge, a plurality of hollow and resilient ball-like buffers, each of which is supported by the frame at a point of juncture of some of said support elements to engage the canopy and thereby to prevent the said canopy from direct engagement with the frame, particularly at the said juncture point, and at least one of the support elements at each juncture of such elements comprising a conduit connected to the buffer at the juncture point and also connected with a source of gas under pressure whereby all of said buffers are gas filled at the pressure of said source.

3,945,157

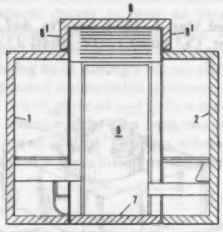
PREFABRICATED WALL ELEMENTS

Zdzislaw Borys, 38 Sudley Road, Bognor Regis, Sussex, England

Continuation of Ser. No. 176,210, Aug. 30, 1971, which is a continuation-in-part of Ser. No. 760,196, Sept. 17, 1968, abandoned. This application Feb. 28, 1974, Ser. No. 447,028
Claims priority, application United Kingdom, Sept. 11, 1970, 43643/70
Int. Cl.² E04B *1/348*
U.S. Cl. 52—36 2 Claims

1. A room unit comprising prefabricated rectangular tray-like wall elements forming a closed rectangular container for transportation of furniture of the room unit; said furniture being prefabricated in said wall elements; generally strip-like prefabricated elements forming together with said wall elements at least one room of greater volume than the container, and means in said elements for securing said elements together to form said container; at least said wall elements being load-bearing structural members; wherein at least some of the

elements have tongue and groove portions arranged and adapted to interfit with corresponding portions of other elements to locate the elements during transportation and when assembled to form said room.



3,945,158

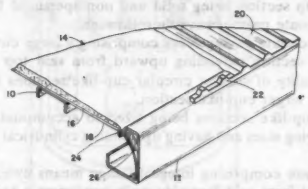
METHOD AND CLIP FOR INSTALLATION OF INSULATION

Ronnie C. Simpson, P.O. Box 444, Carl Junction, Mo. 64834

Continuation-in-part of Ser. No. 499,445, Aug. 22, 1974. This application Feb. 10, 1975, Ser. No. 548,403

Int. Cl.² E04B *7/00*

U.S. Cl. 52—22 **4 Claims**



1. In combination with a metal structure roof having an eave strut along the edge thereof, said eave strut having a substantially cross-sectional C-shape, the open face thereof directed inwardly, and having insulation on the inside surface of the roof, the edge of the insulation terminating at the eave strut; an elongated bar disposed against the edge of the insulation for securing the insulation to the inside surface of the eave strut, and a deformable clamp means disposed against the inside surface of the eave strut in contact with the elongated bar for securing the elongated bar in place.

3,945,159

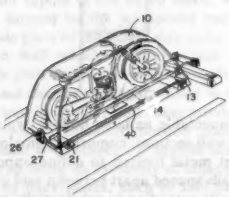
ANTI-THEFT VEHICLE SHELTER

Ronald Carl Girnus, Sr., 3718 - 173rd Court, Hammond, Ind. 46324

Filed Oct. 2, 1974, Ser. No. 511,436

Int. Cl.² E04B *7/16*

U.S. Cl. 52—66 **2 Claims**



1. A housing structure for motorcycles, snowmobiles or the like comrising in combination a rectangular base frame, a central channel, extending from end-to-end of said frame forming a wheel guide for a motorcycle or the like, a rectangular plate secured under said central channel providing a drip pan or base for a kickstand for a motorcycle or the like, a rigid plastic cover of a size to cover a vehicle on said frame, means, pivotally mounting one end of said cover to said frame, means locking the other end of said cover to said frame, means, comprising arms shaped and adapted to extend over and under a horizontally disposed curbstone or the like, and adapted to be removably secured thereto.

3,945,160

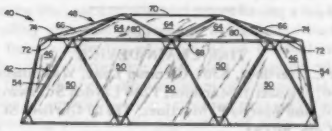
BUILDING STRUCTURES

Christian E. Grosser, Richmond, and Jack M. Roehm, Virginia Beach, both of Va., assignors to Grosser Enclosures Company, Richmond, Va.

Filed Nov. 6, 1974, Ser. No. 521,458

Int. Cl.² E04B *1/34, 7/08*

U.S. Cl. 52—81 **6 Claims**



1. A structure for enclosing a generally rectangular area, said structure having an elongated, vaulted central section composed of plural tiers of upwardly and inwardly inclined, edge abutted triangular panels, all having one horizontally oriented edge, and end wall means at the ends of the vaulted central section for completing the enclosure of said rectangular area, said end wall means each including a structure configured as a segment of a dodecagon, triangular panels edge abutted to said structure, and rectangular structures edge abutted to panels of said central section and to triangular panels of the end wall means.

3,945,161

GLAZING STRIP

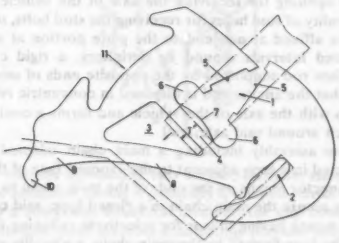
Cyril John Drury, Abingdon, England, assignor to British Leyland UK Limited, London, England

Filed July 11, 1974, Ser. No. 487,638

Claims priority, application United Kingdom, July 12, 1973, 33323/73

Int. Cl.² E06B *3/62*; **E04F** *15/14*

U.S. Cl. 52—208 **6 Claims**



1. In a glazing strip of elastomeric material formed with two oppositely facing channels having solid walls and adapted to receive, respectively, the edge of a glass panel and the inner peripheral edge of a rebated frame for said panel, the improvement according to which said glazing strip comprises a tubular portion surrounding an elongated duct, said duct

being triangular in section and running parallel to said channels, and said tubular portion comprising:

a. a first web having a first surface defining the bottom of the channel for receiving the glass and an opposite surface defining one side of said triangular duct, with both surfaces of said web extending substantially the fall width of said glass-receiving channel;

b. a wall portion defining the second side of said duct and which extends from the side of the channel for receiving the glass remote from said frame-receiving channel to a toe portion of said strip adapted to make dry-sealing contact with the frame; and

c. a second web extending from the end of said first web nearest the channel for receiving said frame to the end of said wall portion adjacent said toe portion, said second web having a length greater than its thickness, an inner surface defining the third side of said duct and an outer frame-contacting surface remote from said duct, the distance of said outer surface from said inner web increasing as said outer surface approaches said toe portion.

3,945,162

TIRE CHAIN DEVICE

Delbert L. Martinez, 8301 Clemson Lane, Westminster, Colo. 80030; Michael J. Martinez, 1240 Leyden St., Denver, Colo. 80220, and Morris P. Martinez, 11610 Garfield St., Thornton, Colo. 80233

Filed Dec. 26, 1974, Ser. No. 536,587
Int. Cl.² B60C *27/02*
U.S. Cl. 152—213 R **1 Claim**

1. A tire chain device adapted to be mounted upon a tire which is in turn mounted on a wheel secured on a vehicle axle by a plurality of stud bolts and connecting lugs, comprising in combination:

a circular backing plate member mountable between said wheel and the vehicle having a plate portion with a central opening for receiving the axle of the vehicle and a plurality of stud holes for receiving the stud bolts, support arms affixed at one end to the plate portion at equally spaced intervals around its periphery, a rigid circular anchor rod supported by the opposite ends of said arms so that the anchor rod is disposed in concentric relationship with the axle of the vehicle and forms a continuous catch around said axle, and

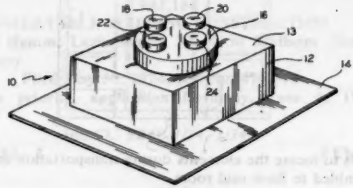
a chain assembly including a main chain adapted to be formed in a loop adjacent to the exposed face of the tire, connector means on the ends of the main chain to releasably secure the main chain in a closed loop, said connector means having means for selectively reducing the size of the loop formed by the main chain, a plurality of cross chain members having one end secured to the main chain at equally spaced intervals along the length of the main chain and the opposite ends having hook-shaped connector means adapted to be releasably connected to said circular rod at variable locations along the circular extent of the rod when the cross chain members are extended across the periphery of the tire.

3,945,163

ABS THERMOPLASTIC CURB ASSEMBLY

William M. Nagler, Chicago, Ill., and Vernon Earl Woosley, Richmond, Va., assignors to The Pate Company, Broadview, Ill.

Filed Mar. 1, 1974, Ser. No. 447,082
Int. Cl.² E04D *13/14*; E04G *15/06*
U.S. Cl. 52—219 **3 Claims**



1. A multi-purpose roof penetration curb to universally provide waterproof and weatherproof passage for pipes and the like passing through roofs,

said curb comprising a unitary plastic five sided box-like structure having an integral base for resting said box-like structure directly on a roof over an opening in the roof,

said five sides of the box-like structure comprising four upstanding side walls and an integral top section extending across said side walls,

said top section being solid and non-apertured but having inchoate passageways therethrough,

said inchoate passageways comprising a large circular cup-like section extending upward from said top section, a plurality of smaller circular cup-like sections integral to said larger cup-like section,

said cup-like sections being sized to accomodate pipes of varying sizes and having upstanding cylindrical side walls, and

said base comprising integral flange means extending outward from said four side walls serving as a base for said box-like structure, whereby said box-like structure is placed over an opening in the roof obviating the necessity of building a curb surrounding said opening.

3,945,164

NAILABLE HOLLOW STRUCTURAL MEMBER

Robert Beck Winsor, Senneville, Canada, assignor to IEC-Holden Ltd., Montreal, Canada

Filed Nov. 13, 1974, Ser. No. 523,472
Int. Cl.² E04B *5/00*; E04C *1/10*
U.S. Cl. 52—377 **22 Claims**

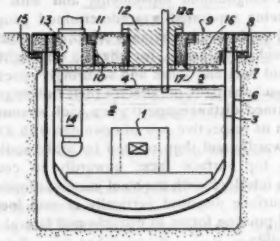
1. An interconnectable nailable hollow structural member for constructing wall sections, comprising an elongated hollow member of sheet metal formed to define opposed clamping walls and end walls spaced apart between said clamping walls, said clamping walls extending in substantially parallel planes, an elongated boss formed in each clamping walls and extending longitudinally of said tubular member in alignment with

one another, one of said clamping walls and one of said end walls having an opposed connectable portion, spacer means for maintaining one of said clamping walls in juxtaposition with a clamping wall of another hollow member and spaced apart by said spacer means to form an elongated opening between said hollow members constituting a nail receiving slot, said elongated boss deforming a nail inserted in said slot, one of said clamping walls having a corner edge in close proximity to said opposed connectable portions, and means for interconnecting two or more of said hollow members with said clamping walls juxtaposed so that said two or more hollow members form a wall section having a substantially uniform wall on one side and a slotted wall on the opposed side.

3,945,165
HEAT-INSULATING SYSTEM FOR A FAST REACTOR SHIELD SLAB

Guy Lemercier, Le-puy-Sainte-Reparade, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed June 17, 1974, Ser. No. 480,269
Claims priority, application France, June 26, 1973, 73.23339
Int. Cl.² E04B 2/00
U.S. Cl. 52—406 **3 Claims**



1. A heat-insulating system for a metallic sole plate of a shield slab of a tank of a fast reactor cooled by a liquid metal in the tank with an atmosphere of neutral gas between the liquid metal and the sole plate with aerosols and liquid metal vapors in the atmosphere, said system being applied against the surface of said sole plate and comprising a set of panels each constituted by a mat of superposed metallic elements of fabric extending parallel to the shield slab to be heat-insulated, wherein each panel is enclosed within a casing applied against the shield slab and formed of two parallelepipedal metallic half-boxes engaged one inside the other, the dimensions of one half-box being slightly larger than the dimensions of the other half-box providing a capillary gap between the half-boxes, wherein the casings are juxtaposed against the surface of the shield slab so as to form a continuous lining, the adjacent casings being separated by a narrow gap, said gaps forming capillary sealing joints for condensation of the aerosols and vapors of the liquid metal, wherein the continuous lining formed by the juxtaposed casings is mounted between the sole plate of the shield slab and a metallic support and protection wall which maintains said casings applied against the sole plate by means of fixing studs passed through said wall and said casings and rigidly fixed to said sole plate at one of their extremities, each stud being provided at the opposite extremity with a threaded portion cooperating with a locking-nut which is tightened-up against said metallic wall, said metallic wall being an assembly of adjacent plates joined to each other by back-plates, each of said back-plates being disposed beneath the corners of four adjacent plates, each back-plate being welded to one plate and sliding over the three other plates.

3,945,166
ROOF PLATE ASSEMBLY

Kiyoshi Hosoda, Kamifukuoka; Teruo Yamauchi, and Masaru Kobayashi, both of Sagamihara, all of Japan, assignors to Suzuki Motor Company, Ltd., Japan

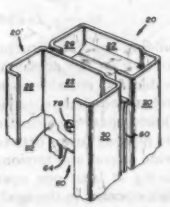
Filed June 3, 1974, Ser. No. 475,878
Int. Cl.² E04D 1/34
U.S. Cl. 52—520 **4 Claims**

1. A roof plate assembly comprising a plurality of individual roof plates interlocked with one another and fastened to a batten or the like, each of said roof plates having a leading end and a trailing end, said leading end being folded back upon itself to form a collector edge having an internal recess, a suspending piece extending from said collector edge and abutting the trailing end of an adjacent roof plate, said trailing end having an upright portion extending generally parallel to said suspending piece of the adjacent roof plate, and an anchoring piece for interlocking said leading end of each of said roof plates with said trailing end of the adjacent roof plate, said anchoring piece including a clamp portion adapted to be fastened to the batten, an insertion portion received within said internal recess of said collector edge, and means for interlocking said anchoring piece with said upright portion of said trailing end, whereby there is provided a double connection at the trailing end of each roof plate by means of both said interlocking means and said suspending piece which extends in abutting relation from the leading end of the adjacent roof plate interlocked therewith.

3,945,167
CLIP FOR THE ASSEMBLY OF COMPOSITE STRUCTURAL MEMBERS

Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Continuation of Ser. No. 411,606, Nov. 1, 1973, abandoned. This application June 4, 1975, Ser. No. 583,364
Int. Cl.² E04B 1/58
U.S. Cl. 52—714 **3 Claims**



1. A clip for assembling two hollow, elongate sheet metal channel members having a generally C-shaped, cross-section, to form a composite structural member, the clip comprising

a first structural member-connecting portion having two opposite side margins, and

a first and a second lip each extending at an angle from two other, opposite side margins of said portion, said first lip having opposite side margins,

at least one of said side margins of both said member-connecting portion and of said first lip being provided with a notch adjacent to the intersection of said first lip and said first member-connecting portion thereby forming at least

two notches on opposing sides of said clip, extending into said lip a distance sufficient to accommodate therewithin the terminal portions of the side flanges of one of the structural members, one of said notches being offset with respect to the other of said notches, and wherein said second lip has a width which is less than the distance of separation between said notches, whereby said lip may be inserted between the terminal portions of the side flanges of one of the structural members thereby contacting each of the terminal portions of the side flanges to prevent the clip from twisting with respect to said one structural member.

3,945,168

REUSABLE SPANNER BAR

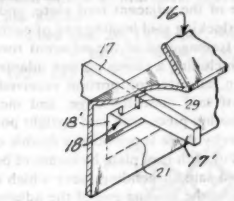
Ernest O. Butts, and John S. Hall, both of Ottawa, Canada, assignors to Hambro Structural Systems Limited, Ottawa, Canada

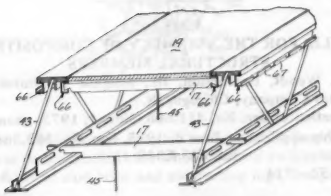
Continuation of Ser. No. 274,414, July 24, 1972, abandoned, which is a division of Ser. No. 220,627, Jan. 25, 1972, Pat. No. 3,845,594, which is a continuation-in-part of Ser. Nos. 872,017, Aug. 29, 1969, abandoned, and Ser. No. 145,758, May 21, 1971, Pat. No. 3,819,143. This application Apr. 15, 1974, Ser. No. 461,221

Claims priority, application Canada, Nov. 4, 1968, 34293; Mar. 16, 1971, 107895; May 28, 1970, 84014

Int. Cl.[2] E04B *1/20*; E04C *3/30*

U.S. Cl. 52—720 **11 Claims**





1. In the art of building concrete structures,

the combination of at least two adjacent steel joists and at least one removable and reusable spanner bar for use in constructing steel and concrete structures by spacing said adjacent steel joists apart a predetermined distance to support concrete pouring forms between those joists at a location to provide lateral and torsional stability,

each said joist having at least one opening, substantially aligned with a like opening in the next joist with the joist steel adjacent each said opening therein being of given gauge and the openings being of at least a predetermined length and given height for receiving respective ends of said spanner bar, the improvement in said spanner bar comprising:

an elongated unitary non-adjustable steel bar having throughout its length a rectangular transverse cross-section with top and bottom surfaces and sides, said top and bottom surfaces being narrower than the sides thereof to form said rectangular cross-section,

said bar further having a central section and having two opposite ends which extend inwardly to said central section with their top surfaces flush therewith,

said ends having a height between said top and bottom surfaces that is substantially less than the height of said central section,

said central section being the same width as said ends and being a multiplicity of times longer than at least one of said ends,

the width from side to side of said opposite ends and the said height thereof being such that the opposite ends can be readily inserted into and removed from said openings only when one of said sides is facing upward,

the said height from top to bottom surfaces of said ends being greater than said given height of said joist opening but less the said predetermined length of said joist opening,

hand means fixedly secured to and depending from said central section for installing and rotating said bar into a said pair of oppositely aligned openings,

securing and distance gauging means in the top one of said surfaces of said bar and only in its said surfaces of said bar and only in its said opposite ends, said securing and distance gauging means consisting of one and only one notch in each of said opposite ends with said notches being rectangular and disposed outwardly from said central section a substantial given distance with at least one of said notches being disposed from the outer end of its respective opposite end a distance substantially less than the said given distance for aiding insertion and removal of said bar into and from said aligned joists openings by reciprocal longitudinal movements and with the said notches being separated a predetermined gauging distance and each notch having a width substantially the same as said given gauge, for aligning and tightly interlocking said bars and joists and securingly spacing adjacent joists substantially parallel for their full length at said predetermined distance apart when each spanner bar is inserted in its respective pair of openings with a said side facing upwardly and then rotated by said handle means until said top surface faces upwardly to cause said notches to interlock with the steel joists as aforesaid with said top surface disposed vertically at said location to cause said pouring forms to provide said lateral and torsional stability.

3,945,169

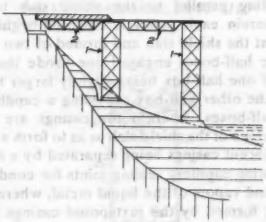
FRAMEWORK STRUCTURES

Nils Harald Ahlgren, Skyttevagen 22, 133 00 Saltsjobaden, Sweden

Division of Ser. No. 354,926, April 27, 1973, abandoned. This application Jan. 23, 1975, Ser. No. 543,363

Int. Cl.[2] E04B *1/00*

U.S. Cl. 52—741 **7 Claims**



1. A method of adjusting the relative position of longitudinal load-bearing elements and transverse bracing elements connected thereto of a framework structure when the framework structure is under load, and when the load is eccentrically applied to said framework structure; where said framework structure comprises a plurality of spaced-aparat longitudinal load-bearing elements and transverse bracing elements interconnecting said longitudinal elements and serving to rigidify the structure and to take up transverse forces, said transverse bracing elements being connected to the longitudinal load-bearing elements on at least one side of the framework structure by connector means which permit relative

longitudinal movement to occur between said transverse bracing elements and said longitudinal load-bearing elements on said at least one side of said framework structure; each of said transverse bracing elements comprising more than one elongate structural member and having such geometrical configuration so that said elongate structural members are secured in a geometrical configuration to retain the spaced-apart longitudinal load-bearing elements at a predetermined spaced-apart distance relative to each other;

said method comprising the steps of:

a. affixing said connector means between said transverse bracing elements and the longitudinal load-bearing elements to said longitudinal load-bearing elements on said at least one side of said framework structure in such a manner that relative longitudinal movement of between any said longitudinal load-bearing element and the transverse bracing elements connected thereto is allowed to occur only after a predetermined force caused by said connector means is overcome; and

b. applying load to at least one longitudinal load-bearing element of said framework structure so that said load is applied eccentrically to said framework structure, the force of said applied load being of a greater magnitude than said predetermined force caused by said connector which is required to be overcome, so as to allow relative longitudinal movement between said at least one longitudinal load-bearing element to which said load is applied and the transverse bracing elements connected thereto.

3,945,170

EXTENSION OF SHELF LIFE OF FRESH PRODUCE

Rodney F. Brown, 11228 Arminta St., Sun Valley, Calif. 91352

Filed Feb. 25, 1975, Ser. No. 552,986
Int. Cl.² B65B *55/16*
U.S. Cl. 53—21 R **2 Claims**

1. A process for the preservation of foods including the steps of:

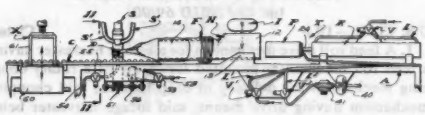
1. washing the foods as required to remove any pesticides which may be present,
2. placing said foods in a container of a material which is essentially airtight but which permits the passage of radio frequency waves therethrough,
3. sealing said container, and
4. irradiating said sealed container with a source of radio frequency electromagnetic energy wherein said source is capable of producing a first band of energy in the range of 20 MHz to 330 MHz and a second band of energy in the range of 50 KHz to 200 KHz, said energy being at power levels between thirty watts and three hundred watts.

3,945,171

FOOD PACKAGING APPARATUS

James W. Marietta, Jr., Alhambra, and Maynard J. G. Tipper, Newport Beach, both of Calif., assignors to James W. Marietta, Jr., Los Angeles, Calif.

Filed Jan. 20, 1975, Ser. No. 542,492
Int. Cl.² B65B *31/06*
U.S. Cl. 53—79 **13 Claims**



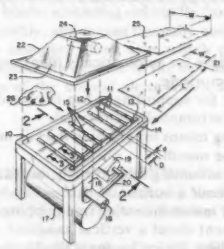
1. A vacuum packaging apparatus comprising an elongate, horizontal tubular horn with an open item receiving rear end and an open delivery front end, an elongate drive member in axial alignment with the horn and shiftable axially forwardly from a normal position where its front end is adjacent the rear end of the horn, to an actuated position within the horn, intermittently operable drive means to shift the member, an elongate pusher with an item engaging front end at the forward end of the member and shiftable from a normal forward position where it projects forwardly from the member to a rear actuated position relative to the member, the pusher being shiftable axially into, through and from the horn, intermittently operable pusher drive means to move the pusher between its normal and actuated position, said front end portion of the pusher occurring at the rear end of the horn when the member and pusher are in their normal position and projecting forwardly from the front end of the horn when the member is in its actuated position and said pusher is in its normal position and occurring within the forward portion of the horn when the member and pusher are in their actuated positions, an elongate vacuum nozzle with an elongate neck fixed relative to the drive member and having an apertured head at its front end and arranged within and extending longitudinally of the pusher when the pusher is in its normal position and projecting axially freely and forwardly from the pusher and the horn when the pusher and drive member are in their actuated positions, valve controlled air conducting means connected with and between the nozzle and air suction means, an elongate supply of tubular packaging film shirred axially on and about the exterior of the horn and having a lead portion extending axially forwardly from the horn and gathered and closed at its forward end by a sealing means, an elongate conveyor occurring below the front end of and extending forwardly from the front end of the horn to support and transport items enveloped in the lead portion of the film when items and film are urged forwardly from the horn by the pusher, and sealing and cutting means spaced forward of the front end of the nozzle when said nozzle projects freely forwardly from the pusher and horn, normally spaced radially outward from the axis of the horn and selectively shiftable into substantial axial alignment with the horn and operable to engage and seal the film at two longitudinally spaced locations between the item and the nozzle and to cut the film between the seals.

3,945,172

VACUUM PACKAGING SYSTEM

Harold W. Johnson, 2751 Wagon Wheel Road, No. 34, Oxnard, Calif. 93030

Filed Feb. 14, 1975, Ser. No. 549,989
Int. Cl.² B65B *31/02*
U.S. Cl. 53—112 A **12 Claims**



1. A vacuum packaging apparatus including, in combination:

a. a platen having a plurality of transverse parallel channels formed in its top surface running from points spaced inwardly of one longitudinal edge across the platen to terminate in a longitudinal trough parallel and adjacent to the opposite longitudinal edge, said platen further including an interior plenum chamber and having holes in the floor of each of said channels communicating with said plenum chamber and a communication passage between said plenum chamber and trough;

b. vacuum drawing means connected with said plenum chamber;

c. a bottom sheet of plastic film positioned on the top surface of said platen and having a given width such that a

longitudinal edge of the bottom sheet does not extend over said trough;

d. a movable housing having an open bottom positioned to be brought down on top of said platen and including heating means; and

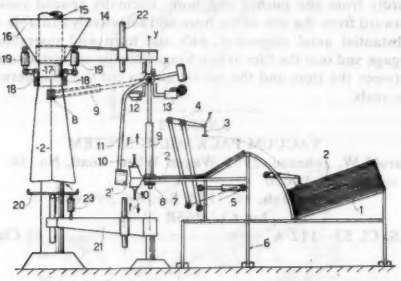
e. a top sheet of plastic film received under said housing above the bottom sheet and of a width greater than the width of the bottom sheet so as to overlie said trough, whereby a vacuum may be drawn in said plenum chamber to preform channels in said bottom sheet by exterior air pressure urging the portions of the sheet overlying said channels into said channels, at least one product to be sealed being placed on said bottom sheet and said movable housing heating said top sheet and bringing it down over the product, the air between the sheets being drawn out through said channels preformed in the bottom sheet and said trough until the bottom and top sheet portions brought into contact seal together after substantially complete evacuation of the air therebetween.

3,945,173

MACHINE FOR AUTOMATICALLY FILLING AND SEALING BAGS

Riccardo Buzzi, Via 5 Maggio No. 19, Milan, Italy

Filed Sept. 18, 1974, Ser. No. 507,200
Claims priority, application Italy, Oct. 5, 1973, 29792/73
Int. Cl.² B65B *43/30, 43/34, 43/46, 43/60*
U.S. Cl. 53—188 **11 Claims**



1. A machine for automatically filling and sealing bags, said machine comprising:

A. means for supporting a bag in closed condition with its mouth substantially horizontal,

B. gripping means for gripping the bag on both sides thereof near the mouth,

C. means mounting said gripping means for swinging movement about a horizontal axis,

D. further means mounting said gripping means for swinging movement about a vertical axis,

E. a batching device having a discharge,

F. means actuating said first-named swinging means to locate said gripping means adjacent both sides of said bag near the mouth thereof,

G. means further actuating said gripping means to cause said gripping means to engage said bag at both sides thereof adjacent the mouth,

H. spreading means to open the mouth of the bag gripped by said gripping means,

I. means to further actuate the gripping means to swing the same about the horizontal axis with its mouth open and to place the open mouth below the discharge of the batching device with the bag in vertical position, open mouth uppermost,

J. said batching device being energizeable to fill the bag beneath the discharge thereof,

K. a transporting means,

L. a bag closure means,

M. means further actuating the gripping means to move the filled bag about a vertical axis from beneath the batching means into operative engagement with the closure means and then onto the transporting means,

N. means to actuate the closure means as the bag enters into operative engagement therewith, and

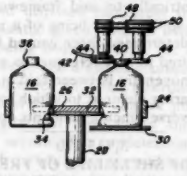
O. means to open the gripping means when the bag reaches the transporting means so as to discharge the filled and closed bag onto the same.

3,945,174

APPARATUS FOR CAPPING AND CONTROLLING LEVEL OF FLUID IN FLEXIBLE CONTAINERS OR BOTTLES

Henry H. Franz, 3201 Falls Cliff Road, Baltimore, Md. 21211

Filed May 7, 1975, Ser. No. 575,349
Int. Cl.² B65B *3/24, 7/28;* **B67B** *3/20*
U.S. Cl. 53—289 **3 Claims**



1. In a cap applying apparatus embodying a conveyor for delivering a plurality of flexible empty containers to a rotary turret and for receiving from said turret a plurality of containers having a predetermined amount of fluid therein, a first station for delivering and loosely positioning caps or closures upon said containers, a second station spaced from said first station for tightening said caps or closures upon said containers, a discharge member positioned between said conveyor and turret for engaging said fluid filled containers and moving them from said turret through both of said stations and onto said conveyor, a disc member associated with said discharge member for engaging a fluid filled container and compressing a surface thereof to raise the level of the fluid therein as said container is moved from the turret through the first and second stations and onto the conveyor by said discharge member, said first station having a cap or closure guide member for engaging each cap or closure to position same upon said container as said container is being moved to said second station by said discharge member.

3,945,175

VARIABLE SPEED FEED ROLL DRIVE MECHANISM FOR FORAGE HARVESTERS

Reynold Barkstrom, Hinsdale; Calvin P. Rickerd, La Grange Park, and William C. Swanson, Clarendon Hills, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Oct. 2, 1973, Ser. No. 402,878
Int. Cl.² A01D *69/00*
U.S. Cl. 56—10.8 **3 Claims**

1. A feed roll drive mechanism for a forage harvester having a feed roll mechanism mounted forwardly of a rotary chopping mechanism for delivery of crop thereto, said chopping mechanism having drive means, said forage harvester being adapted to receive a forwardly mounted gathering unit and having means for feeding crops to said feed roll mechanism, comprising:

a housing;

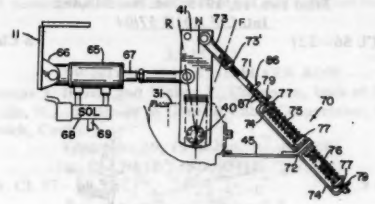
power input means driven by said chopping mechanism drive means;

a reversible hydrostatic transmission, said transmission including a charging pump, driven by said power input

means and mounted on said housing and having an output shaft extending therewithin, the forward speed of said output shaft being infinitely variable relative to said input drive means within a range from zero to a maximum;

fixed ratio speed reduction means mounted entirely within said housing, said speed reduction means being driven by said transmission output shaft;

A feed roll drive shaft drivingly connected to said feed roll mechanism and extending within said housing to a driven connection with said speed reduction means;



control means associated with said transmission for controlling the speed of said output shaft; and

actuating means operatively associated with said control means for selectively determining the speed of said feed roll mechanism relative to said input drive means, said actuating means selectively positioning said control means in one of three positions consisting of maximum forward, neutral, and reverse, selectively adjustable stop means being operatively associated with said control means for defining said maximum forward position of said control means.

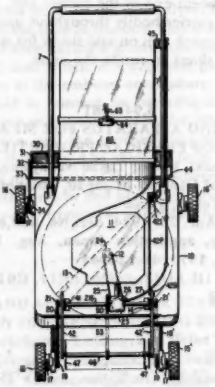
3,945,176
COMBINATION POWER DRIVEN LAWN-MOWER AERATOR

Anthony P. Vicendese, 50 Sutton Drive, and Frank Vicendese, 617 Plainfield Ave., both of Berkeley Heights, N.J. 07922

Filed Sept. 16, 1974, Ser. No. 506,347

Int. Cl.² A01D *43/02*

U.S. Cl. 56—11.8 **5 Claims**



1. A rotary power driven lawn mower comprising a base plate, a pair of front driving wheels and a pair of rear idler wheels attached to said base plate, an engine mounted above said base plate, rotary blade means positioned below said base plate and coupled to be driven to said engine, power drive means coupling said front drive wheels to said engine, a pair of swing arms hingeably mounted to said base plate, a tine-bearing shaft rotatably journalled in said swing arms extending between said front driving wheels, and means for engageably coupling said tine-bearing shaft to said engine.

3,945,177
METHOD AND APPARATUS FOR CUTTING SUGAR CANE

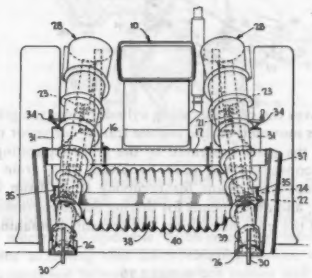
Donald Alan Scott, Pershore, England, and Colin Hudson, St. Thomas, Barbados, assignors to F. M. McConnell Ltd.

Continuation of Ser. No. 284,598, Aug. 29, 1972, abandoned. This application July 24, 1974, Ser. No. 491,951

Claims priority, application United Kingdom, Nov. 19, 1971, 53957/71

Int. Cl.² A01D *35/26*

U.S. Cl. 56—12.7 **14 Claims**



1. Apparatus, adapted to be mounted on a propelling vehicle, for cutting sugar cane comprising: two upwardly extending combing elements spaced apart across the width of a corresponding vehicle, a flattening element extending transversely to the direction of travel of such vehicle and spaced above the ground to the rear of the combing elements with respect to the intended direction of travel of such vehicle, a cutter mounted on such propelling vehicle to the rear of the flattening element, and means for transmitting a powered drive to the cutter, which cutter is adapted to sever, adjacent the ground, sugar cane flattened by the flattening element, wherein the cutter includes a central rotatable hub assembly, a number of cutter blades extending outwardly from the lower end of the hub assembly, and means pivotally connecting the blades to the hub assembly along axes which permit each blade to swing up and down relative to the hub assembly and follow the contours of the ground along which such vehicle travels.

3,945,178
CROP HARVESTING AND THRESHING MACHINES

Gilbert Delfosse, Mere, and Jose Andiano, Vanves, both of France, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed July 24, 1974, Ser. No. 491,441

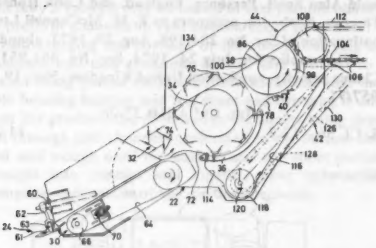
Claims priority, application United Kingdom, July 25, 1973, 35391/73

Int. Cl.² A01D *41/06*

U.S. Cl. 56—14.6 **9 Claims**

1. A crop harvesting and threshing machine including a mobile frame; a crop collecting platform attached to the mobile frame; lift means to raise and lower at least part of the platform relative to the mobile frame; a crop threshing cylinder means rotatably supported on the platform for rotation about its long axis and extending across substantially the full crop collecting width of the platform; a concave mounted adjacent to the crop threshing cylinder means and cooperable with said crop threshing cylinder means to thresh crop material received by the crop collecting platform; feed means to feed cut crop material to the crop threshing cylinder means;

a grain separating apparatus including a straw conveyor mounted on the platform and extending across substantially the full crop collecting width of the crop collecting platform, said straw conveyor including flight means for moving straw in a direction parallel to the long axis of the crop threshing cylinder means, and a screen concave member cooperating with the straw conveyor to separate grain from crop material



which leaves the crop threshing cylinder means; a grain cleaning means mounted on the mobile frame; conveyor means for receiving the grain separated by the grain separating apparatus and conveying the grain received to a grain cleaning means; conveyor means for receiving straw from the straw conveyor; and drive means for driving the crop treating mechanisms of the crop harvesting and threshing machine.

3,945,179

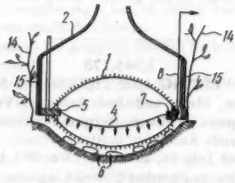
COTTON PICKUP

Petr Nikolaevich Listov, Krasnostudenchesky proezd, 11, kv. 16, Moscow; Madzhid Saidovich Ganiev, ulitsa Tsentralnaya, 8, p/o Kirda, Tashkentskaya oblast; Vladimir Ivanovich Buromsky, ulitsa Kuusinena, 7, kv. 159; Lidia Ivanovna Bogdanova, ulitsa Yasnopolyanskaya 6, kv. 4, both of Moscow; Enver Tefikovich Kalafatov, M. Severo-Vostok, 67, kv. 2, Tashkent; Dmitry Nikolaevich Topalidi, ulitsa Veshnevaya 10, p/o Kirda, Tashkentskaya oblast; Vitaly Petrovich Rodionov, ulitsa Vereschagina, 141, kv. 10, Alma-Ata; Edem Idrisovich Junusov, ulitsa Tsentralnaya, 10, Syr-Darinskaya oblast, and Valery Pavlovich Fedorov, ulitsa kirova, 12, Alma-Ata, all of U.S.S.R.

Filed Mar. 31, 1975, Ser. No. 563,384

Int. Cl.² A01D *45/18*

U.S. Cl. 56—28 **3 Claims**



1. A cotton pickup comprising: a self-propelled frame; a rotary gripping means arranged on said self-propelled frame and including a dielectric pressurized cylinder having a plurality of teeth on the outer surface thereof for gripping the cotton; a source of electric charges mounted in a fixed position within said pressurized cylinder and imparting the charges to the inner surface of said pressurized cylinder; said pressurized cylinder having a wall whose thickness is selected so that under the action of the charges generated by said electric charge source an electric field capable of attracting the cotton to the outer surface of said pressurized cylinder is produced outside said pressurized cylinder between it and the ground; a doffing means arranged in close vicinity to said pressurized cylinder for removing the cotton from said pressurized cylinder; a transporting means arranged under said doffing means and effecting the transportation of the waste cotton into a collecting tank.

3,945,180

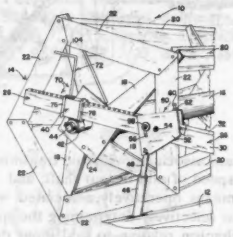
CAM OPERATED REEL LOCK AND ADJUSTMENT

Donald J. Sinclair, Silvis, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Feb. 10, 1975, Ser. No. 548,482

Int. Cl.² A01D *57/04*

U.S. Cl. 56—221 **8 Claims**



1. In an agricultural implement, the combination with an adjustable bearing support for one end of a harvester reel associated with a combine platform, said support embodying an elongated reel-supporting arm having a longitudinal row of closely and equally spaced reaction holes formed therein, and an open-ended tubular sleeve-like carrier slidable longitudinally on said arm, a reel bearing being fixedly mounted on the carrier, an operating tool for effecting step-by-step indexing movements of the carrier on the supporting arm in increments of movement equal to the center-to-center distance between adjacent reaction holes, said tool including a shank adapted to be projected into a reaction hole next adjacent to either end of the carrier and exteriorly of the latter, a radially extending cam on said shank in the medial region thereof and effective when the shank is disposed in said next adjacent reaction hole to engage the adjacent end of the carrier and, by a camming action, index the carrier bodily throughout one increment of movement, and a crank arm on said shank for manually applying torque to the shank to rotate the same.

3,945,181

PROCESS AND APPARATUS FOR MEASURING UNIFORMITY OF PHYSICAL PROPERTIES OF YARN

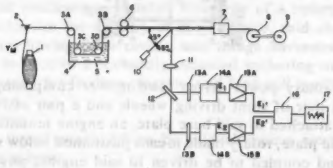
Chikayasu Yamazaki, Kyoto; Takao Nakayama, and Noriyuki Kawabe, both of Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Apr. 25, 1974, Ser. No. 463,890

Claims priority, application Japan, Aug. 11, 1973, 48-124943; Aug. 11, 1973, 48-124944

Int. Cl.² D01H *13/32, 13/26, 13/14*; G01N *21/00*

U.S. Cl. 57—34 R **14 Claims**



1. A process for measuring uniformity of the physical prop-

erties of a yarn to be tested, said yarn having a twist of at least about 100 turns per meter, which comprises the steps of:

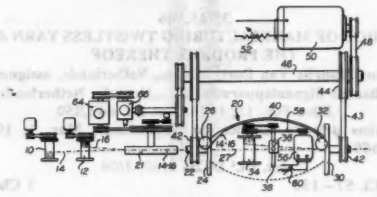
1. applying to the running yarn a beam which has a spectrum that is continuous from the visible region to the near-infrared region, said beam being applied at such an angle that it is reflected from said yarn,
2. dividing said reflected beam into two,
3. imparting the characteristics of the near-infrared region to one of said divided beams,
4. imparting luminosity characteristics to the other of said divided beams, and
5. sensing the ratio of the intensity of said reflected beams.

3,945,182

TWISTING MACHINE FLYER BOW

Thomas J. Dover, and Walter F. Thompson, both of Somerville, N.J., assignors to General Cable Corporation, Greenwich, Conn.

Filed Nov. 19, 1974, Ser. No. 525,194
Int. Cl.² H01B *13/02;* **D01H** *7/24, 7/86*
U.S. Cl. 57—58.52 **9 Claims**



1. A machine for twisting communication conductors together including in combination means for supplying the conductors to a twisting zone, a flyer that rotates about a longitudinal axis at the twisting zone, said flyer comprising a first guide at an upstream end of the flyer and around which the wires pass to a direction at an acute angle to the axis of rotation of the flyer, a second guide at a downstream end of the flyer and around which the wires are brought back into line with the axis of rotation of the flyer, means for advancing the wire under tension, a flyer bow extending along a generally arcuate path between the guides and having orbital movement around the axis of rotation of the flyer, the bow having one face which is the part of the bow that is closest to the axis of rotation, said face having a groove therein, extending lengthwise thereof, and which is a recessed part of said face and which is open to the ambient atmosphere, and with which the wires are held in contact by centrifugal force during their travel from one end of the flyer to the other during operation of the machine, and the groove being deep enough for the wires to nest therein and be shielded from the windage caused by the orbital movement of the bow whereby the wires remain in contact with the bow and protected from displacement and looping caused by transverse windage when the flyer is rotating.

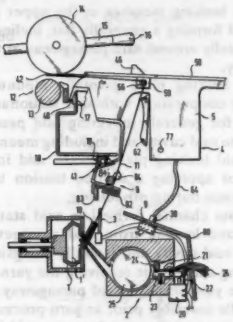
3,945,183

METHOD AND APPARATUS FOR STARTING A THREAD IN OPEN-END SPINNING DEVICES

Hans Landwehrkamp, Lenting, and Heinz Niestroj, Ingolstadt, both of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany

Filed Oct. 7, 1974, Ser. No. 513,034
Claims priority, application Germany, Oct. 13, 1973, 2351458
Int. Cl.² D01H *13/16, 15/00*
U.S. Cl. 57—34 R **12 Claims**

1. Apparatus for automatically actuating components for spinning startup at a spinning station having a spinning chamber, a thread drawoff opening, a thread tension detector, a thread-winding spool engageable with drive means, a sliver feed and fiber-resolving device, electromagnetic means for interrupting sliver feed, and an electric circuit connecting the electromagnetic means and the thread-tension detector in response to loss of tension in the thread, which apparatus comprises a pack for carrying retractable supporting means for holding the winding spool out of engagement with its drive means, means biasing said supporting means into retracted



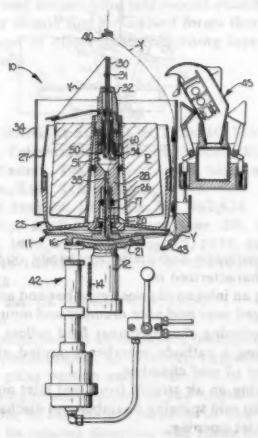
position, means for projecting said supporting means into spool-holding position, means for latching said supporting means in projected position in opposition to said biasing means, electrically-operable latch-releasing means, switch means for actuating said latch-releasing means, and timing means connected between said switch means and said latch-releasing means for delaying actuation of said latch-releasing means a predetermined time after actuation of said switch means.

3,945,184

SELF-THREADING YARN BRAKE MECHANISM IN A HOLLOW SPINDLE ASSEMBLY OF A TEXTILE YARN PROCESSING MACHINE

Gustav Franzen, Krefeld, Germany, assignor to Palitex Project Company GmbH, Germany

Filed Apr. 4, 1975, Ser. No. 565,059
Int. Cl.² D01H *7/86, 13/10*
U.S. Cl. 57—58.86 **10 Claims**



1. In a textile yarn processing machine, such as a two-for-one twister and the like, having spindle assemblies for the processing of yarn and each including a carrier mechanism for

carrying a package of yarn to be withdrawn and processed and defining an elongate passageway therethrough for the yarn withdrawn from the package and an enlarged cavity forming a part of and enlarging said passageway at said cavity; the combination therewith of an improved yarn brake mechanism positioned in said cavity for applying a desired tension to the yarn passing therethrough and being characterized by a self-threading construction, said yarn brake mechanism comprising:

a stationary braking member in the upper portion of said cavity and forming a generally flat, inclined braking surface generally around said passageway at the entrance to said cavity;

a movable braking plate pivotally mounted within said cavity for cooperation with said stationary braking surface and for generally covering said passageway at the entrance to said cavity and including means for adjustably biasing said braking plate toward said inclined braking surface for applying a desired tension to yarn passing therebetween during processing;

a yarn bypass channel formed in said stationary braking member and leading from said passageway at the entrance to said cavity and laterally alongside said stationary braking surface for receiving the yarn during threading of the yarn through said passageway for start-up of said spindle assembly prior to yarn processing and eliminating passage of the yarn between said braking surface and braking plate during threading; and

an obliquely extending, deflection surface formed in said stationary braking member between said bypass channel and said inclined braking surface for deflecting the yarn from said bypass channel into position between said braking surface and braking plate after threading of the yarn and during start-up of said spindle assembly.

3,945,185

PNEUMATIC AND STATIC ELECTRICITY OPEN-END SPINNING METHOD AND APPARATUS THEREFOR

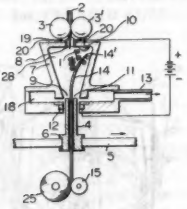
Minoru Nakamura, Amagasaki, and Shin Kosaka, Itami, both of Japan, assignors to Osaka Kiko Co., Ltd., Osaka, Japan

Filed Dec. 13, 1974, Ser. No. 532,492

Claims priority, application Japan, Dec. 19, 1973, 48-143121

Int. Cl.² D01H 1/12

U.S. Cl. 57—58.95 10 Claims



1. A pneumatic and static electricity open-end spinning method, characterized in:

charging an inlet anode nose member and an anode member arranged near said nose member and mounted on the wall of a spinning chamber near feed rollers, and oppositely charging a cathode member mounted at a downstream portion of said chamber;

introducing an air stream from said inlet anode nose member into said spinning chamber and discharging it through an outlet opening;

within said spinning chamber, charging a single fiber with the same charge as the anode nose member which fiber has been separated from a strand of sliver or roving being delivered from a feed roller;

twisting said single fiber into a yarn projecting upwardly from a twister rotating continuously and arranged downstream of said spinning chamber.

2. An electrostatic and pneumatic open-end spinning apparatus, comprising:

a feed roller;

a stationary spinning chamber with a large cavity arranged downstream of said feed roller;

an inlet anode nose member, charged with static electricity, mounted in said spinning chamber with a narrow clearance between itself and the feed roller;

an anode member, charged with the same charge as said nose member, arranged near but spaced from the inlet anode nose member, and mounted in said spinning chamber;

a rotating twister arranged at a downstream position;

a cathode ring; charged oppositely from the anode member, arranged coaxially with said twister but not in contact with the twister;

a suction source which draws air through the inlet anode nose member into the spinning chamber and then, out of the spinning chamber.

3,945,186

METHOD OF MANUFACTURING TWISTLESS YARN AND THE PRODUCT THEREOF

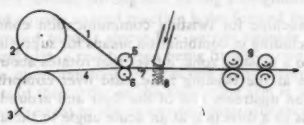
Jacobus Maurits Van Dort, Almelo, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Feb. 15, 1974, Ser. No. 442,850

Claims priority, application Netherlands, Mar. 1, 1973, 7302859

Int. Cl.² D02G 3/40, 3/04

U.S. Cl. 57—153 7 Claims



1. A method of manufacturing twistless yarn from a staple fibre material and a continuous filament yarn which is potentially adhesive upon application at least of moisture, including the sequential steps of:

combining the continuous filament yarn with the staple fibre material to obtain a mixed fibre ribbon,

activating said continuous filament yarn to bring it at least into a plastic state,

drafting the mixed fibre ribbon in a wet condition to form a thinner fibre ribbon, and

bonding said thinner fibre ribbon.

3,945,187

TEXTILE SPINDLE

Dieter Widmer, Uster, Switzerland, assignor to Spindel-,Motoren- Und Maschinenfabrik A.G., Uster, Switzerland

Filed July 3, 1974, Ser. No. 485,672

Claims priority, application Germany, July 16, 1973, 2336113

Int. Cl.² D01H 7/12

U.S. Cl. 57—135 9 Claims

1. A textile spindle comprising:

a elongate tubular spindle housing;

a first elastic bearing element fitted in the housing at one end thereof;

a second elastic bearing element fitted in the housing at the other end thereof and located between first and second engagement members;

a rigid support tube extending within the housing and supported therein by the first and second elastic bearing elements, the rigid support tube having one end region

protruding from said one end of the housing and being enlarged at said one end region, and the first engagement member being between the second elastic bearing element and the support tube and being connected to the support tube in such a manner that it is displaceable axially of the support tube yet is substantially fixed against displacement radially thereof;

a collar bearing fitted in the enlarged end region of the support tube;

a footstep bearing fitted in the support tube at the other end thereof; and

a spindle blade supported within the rigid support tube by the footstep bearing and the collar bearing.

3,945,188

METHOD OF SPINNING SYNTHETIC TEXTILE FIBERS

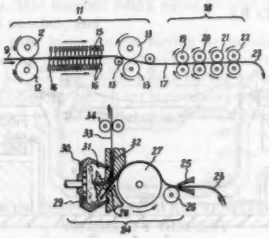
Pierre Muller, Le Moulin, Ternand, 69620 Le-Bois-D'Oingt, France

Filed Apr. 15, 1974, Ser. No. 460,897

Claims priority, application Luxemburg, Apr. 19, 1973, 67466; Dec. 10, 1973, 68957

Int. Cl.[2] D01H *1/12*; D01G *1/08*

U.S. Cl. 57—156 10 Claims



1. Method of spinning threads consisting at least partially of synthetic textile fibers which comprises the steps of stretch breaking continuous filaments of substantially circular section into fibers having a staple length distribution approximating that of natural cotton to obtain a strip of parallel fibers, crimping said strip, and open end spinning said crimped and stretch broken strip.

3,945,189

METHOD OF PRODUCING KNOP YARN

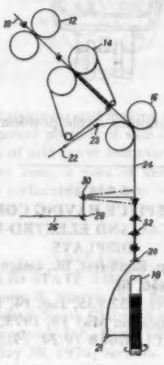
Lindsay Alfred Allen, Highton, Australia, assignor to I.W.S. Nominee Company Ltd, London, England and Commonwealth Scientific & Industrial Research Organization, Canberra, Australia

Filed Mar. 15, 1974, Ser. No. 451,779

Claims priority, application United Kingdom, Mar. 16, 1973, 12676/73

Int. Cl.[2] D02G *3/34*

U.S. Cl. 57—160 4 Claims



1. A method of producing a knop yarn comprising the steps of:

supplying an untwisted first fibrous strand to a drafting device;

drafting said first strand in said device;

drawing said drafted first strand from said drafting device onto a twisting spindle thereby spinning it to form a foundation yarn on said spindle;

supplying a second fibrous strand under tension to said first strand between said drafting device and said twisting spindle and causing it to be wound about said first strand while said first strand is spun into yarn;

and adjusting said tension until said second strand oscillates with respect to said first strand and forms thereon intermittent knops of effect yarn comprising layers of said second strand.

3,945,190

SWITCH MECHANISM FOR ELECTRONIC TIMEPIECE

Satoshi Kimura, Tokorozawa; Yoshifumi Mochizuki, Kodaira, and Tetsuya Yasuda, Tokyo, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed June 24, 1974, Ser. No. 482,634

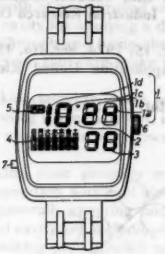
Claims priority, application Japan, June 28, 1973, 48-72311; Aug. 28, 1973, 48-94040; Aug. 27, 1973, 48-100280; Sept. 29, 1973, 48-108917; Oct. 6, 1973, 48-116100; Oct. 19, 1973, 48-117646

Int. Cl.[2] G04B *19/24*, *19/30*

U.S. Cl. 58—4 A 6 Claims

1. A switch mechanism for an electronic timepiece comprising an electric optical display, an exteriorly operated member having a square pillar portion and provided in its axial direction with a plurality of stable positions and rotatable about its axis at at least one of said stables positions of axial direction and provided in its rotating direction with stable positions of rotational direction, an earasing switch for erasing the display at the stable positions of rotational direction of said exteriorly operated member, a correction switch for correcting the display at a stable position of axial direction, and a change over

switch for changing over the display when said exteriorly operated member is moved from one of said stable positions



of axial direction to another stable position of axial direction and vice versa.

3,945,191

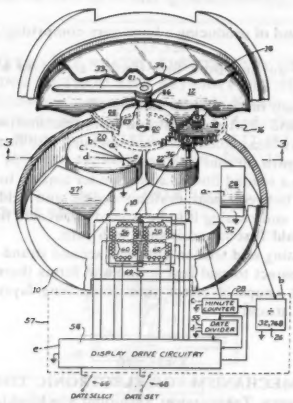
ELECTRONIC TIMEPIECE HAVING COMPLEMENTARY ELECTRO-OPTICAL AND ELECTRO-MECHANICAL DISPLAYS

Petrus A. van Berkum, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Division of Ser. No. 432,935, Jan. 14, 1974, Pat. No. 3,911,665. This application May 19, 1975, Ser. No. 578,701

Int. Cl.² G04B *19/24, 19/30*

U.S. Cl. 58—4 A **4 Claims**



1. A compact electronic watch capable of displaying multiple time-related functions at relatively low levels of power consumption, comprising within a housing;

battery means for storing electrical energy;

pulse-drivable electro-mechanical time display means for displaying only the hours and minutes of the day, said electro-mechanical time display means comprising an hour hand and a minute hand, a stepping motor, and means including a gear train for mechanically coupling said stepping motor to said hour and minute hands;

a normally-off, two-digit LED (light-emitting diode) display for displaying at least one additional time-related function having a lower normal use factor than hours and minutes, such as seconds or the date;

manually operable switch means for causing said LED display to be activated only on command by the user; and

control means coupled directly to said battery means, directly to said stepping motor, and indirectly to said LED display through said switch means, said control means including pulse generating means for generating a train of highly regular electrical pulses for supply to said stepping motor to drive said hour and minute hands in order that hours and minutes, the most-used time functions, are displayed continuously for the convenience of the user, said control means developing a control signal for activating said LED display upon closure of said switch means.

3,945,192

GEAR ENCLOSURE FOR CLOCKS

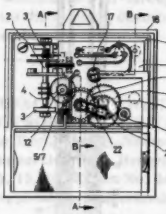
Robert Wolber, Lauterbach, Germany, assignor to Gebruder Junghans GmbH, Schramberg, Wurtt., Germany

Filed Sept. 25, 1974, Ser. No. 509,316

Claims priority, application Germany, Sept. 28, 1973, 35107[U]

Int. Cl.² G04B *13/02, 29/02, 37/00*

U.S. Cl. 58—7 **6 Claims**



1. A gear enclosure for clocks having a gear mechanism and an associated indicator mechanism, the enclosure comprising, in combination: a single base plate in and on both sides of which said gear mechanism is mounted; a plastic housing capsule for limiting one side of said gear mechanism, which has said indicator mechanism provided thereat, and for both axially and radially guiding and journeling portions of said indicator mechanism; and a support plate associated and substantially parallel with said base plate, for limiting the other side of said gear mechanism.

3,945,193

BATTERY HOLDER

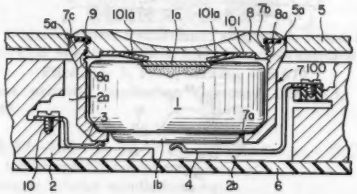
Tetuya Yasuda, Tokyo, and Yoshio Iinuma, Higashimurayama, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1974, Ser. No. 436,822

Claims priority, application Japan, Jan. 26, 1973, 48-10882

Int. Cl.² G04C *3/00*

U.S. Cl. 58—23 BA **8 Claims**



1. In a battery powered watch having a case on one side, a dial on an opposite side, a watch mechanism disposed between the case and dial, and a battery having a first pole and a second pole protruding from one side of the battery, the improved battery holder comprising:

a. means attached to said case to attach said battery to said case wherein said battery is located on the side of said

case facing the dial, such that said battery remains attached to the case upon removal of the case from the watch, said attachment means being in electrical contact with said first pole of said battery;

b. first flexible terminal means electrically connecting said attachment means to said watch mechanism; and

c. second flexible terminal means electrically connecting the second, protruding pole of said battery to said watch mechanism.

3,945,194
ELECTRONIC QUARTZ CLOCK WITH INTEGRATED CIRCUITS

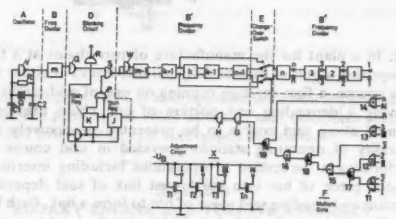
Wolfgang Gollinger, Gundelfingen, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Dec. 5, 1974, Ser. No. 529,772

Claims priority, application Germany, Dec. 15, 1973, 2362470

Int. Cl.² G04C *3/00;* **H03K** *29/00;* **H03B** *19/12*

U.S. Cl. 58—23 R **2 Claims**



1. In an electronic quartz clock, a frequency divider integrated circuit having an adjustable and programmable dividing factor comprising:

means for providing a negative voltage;

a crystal oscillator;

an asynchronous frequency divider having a predetermined number of stages;

a blanking circuit coupled between a first predetermined number of divider stages and a second predetermined number of divider stages;

a switch coupled between said second predetermined number of stages and a third predetermined number of stages such that a portion of said second predetermined number of stages can be cut out of said frequency divider;

an adjustment circuit for generating a number of control signals, said number being equal to said third predetermined number; and

multiple gate logic means having as inputs said control signals and the outputs of said third predetermined number of stages, said logic means having an output coupled to said blanking circuit for suppressing a number of pulses generated by said oscillator in an evenly distributed manner.

3,945,195
ULTRA THIN ELECTRONIC WATCH WITH IMPROVED VISIBILITY DISPLAY

Daniel W. Mason, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Jan. 13, 1975, Ser. No. 540,371

Int. Cl.² G04C *3/00*

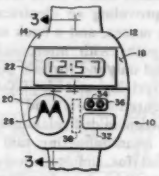
U.S. Cl. 58—23 R **4 Claims**

1. In an electronic watch:

a case having top and bottom surfaces generally parallel to each other, the distance between the top and bottom surfaces defining a body of thickness of said watch,

a cover having a substantially transparent top and four sides substantially transparent occupying a first portion of and extending above the top surface of said case, and

a passive display extending into said cover above the top surface of said case a sufficient extent to allow light entering the sides of said cover to enter said display, thereby



increasing its brightness and making said display easier to read, and a second portion of said case adjacent one of said four sides of said cover and extending above the top surface of said case, a part of said battery extending above the top surface of said case into said second portion of said case.

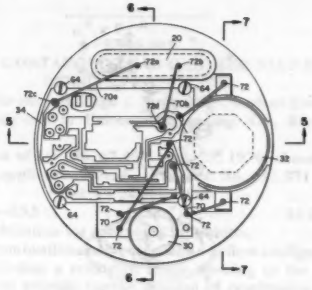
3,945,196
UNIVERSAL SOLID STATE TIME-KEEPING PACKAGE

John R. Wood; James B. Morris, Sr., both of San Jose, and Arnold M. Massoletti, Santa Clara, all of Calif., assignors to American Microsystems, Inc., Santa Clara, Calif.

Filed May 30, 1974, Ser. No. 474,397

Int. Cl.² G04B *19/30;* **G04C** *3/00;* **G04B** *37/00;* **H02K** *1/07*

U.S. Cl. 58—50 R **17 Claims**



1. An electronic digital solid state watch assembly comprising:

a. a watch frame having a front time display side thereof with a display opening therein and defining an interior cavity, and a backplate removably mounted on a back side thereof and closing said cavity;

b. a nest member located entirely within and occupying said cavity and having a time display window visible through the display opening of said frame, said nest member including somewhat irregular interior portions contoured to form a plurality of recesses;

c. digital display means for providing a visual time display, said display means packaged in a unit having two flat and generally parallel surfaces with means forming digital time display segments that are viewable on a front surface, and electrical connection points on a back surface, said display means being sized to fit closely within a display unit recess of said nest, said nest having means in said display unit recess for holding said display unit in place so that said time display segments may be viewed

through the display window of the nest; d. a crystal unit mounted within said nest;

e. power supply means retained within said nest;

f. a printed circuit substrate containing electronic circuitry powered by said power supply means for generating time signals from said crystal unit and for driving said digital display means and substrate having two flat generally parallel surfaces with a front surface containing contact means for providing an electrical interconnection with said display means, and a back surface having electrical conductor paths with interconnection means for said quartz crystal unit and for said power supply means, said substrate overlying said display unit recess within said nest and secured therein, and

g. means between said display unit and said substrate for electrically interconnecting said display means to said substrate and for simultaneously mechanically locking said display unit in place in said nest when said substrate is secured within said nest.

3,945,197

TIMEPIECE

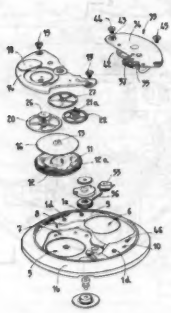
Raoul-Henri Erard, La Chaux-de-Fonds, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed May 8, 1974, Ser. No. 467,856

Claims priority, application Switzerland, May 10, 1973, 6784/70

Int. Cl. G04b *33/00*

U.S. Cl. 58—59 **3 Claims**



1. A timepiece including in combination, a casing (1) forming a part of the movement frame with the casing bottom (1*a*) forming the main part of the movement frame, the casing bottom including a relief formed therein and adapted to the relief of the elements of the movement, said casing bottom supporting at least a part of the shafts of the gearing of the movement and being provided with at least one bearing surface (9) for supporting at least one bridge (14) of the frame of the movement and for maintaining the said gearing in position and with at least one bearing surface (10) for an element (33) of the movement, the bearing surface (10) of the element (33) of the movement constitutes a second bearing surface for the said bridge (14) of the frame, while the bearing surface (9) for the bridge (14) constitutes a second bearing surface for the said element (33) of the movement.

3,945,198

CHAIN MAKING APPARATUS

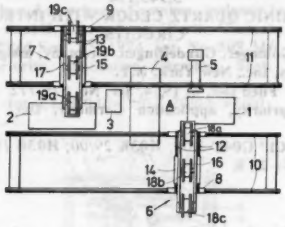
Sven-Erik Lindén, Laxa, and Hans Erik Otto Schalling, Hasselfors, both of Sweden, assignors to Elektriska Svetsningsaktiebolaget, Gothenburg, Sweden

Filed Oct. 22, 1974, Ser. No. 517,004

Claims priority, application Sweden, Oct. 25, 1973, 7314459

Int. Cl.² B21L *7/00*

U.S. Cl. 59—16 **1 Claim**



1. In a plant for the manufacture of two chains at a time comprising a pair of substantially parallel tracks at either side of a course, a first carriage running on one of said tracks for moving a depending end portion of one chain previously formed along said course to be presented successively to a plurality of operating stations provided in said course for performing a succession of operations including inserting a heated piece of bar into the lowest link of said depending portion and bending said piece of bar to form a link, flash butt welding the joint of said link and trimming the joint to remove the welding burr or bulge, and a second carriage running on the other track for moving a depending end portion of the other chain along said course to be presented to said operating stations, the improvement comprising a transverse frame movably supported by each of said carriages, and conveyor means supported by each of said transverse frames for advancing the chain outwards from said course in the transverse direction, said conveyor means including a take-up member supporting the depending portion of the chain, each of said transverse frames being displaceable transversely to adjust the transverse position of said take-up member within a range allowing proper positioning of the vertically depending chain portion with respect to the operating stations and also allowing adjustment of the take-up members to a transverse position with respect to each other in which there is a transverse clearance between said take-up members permitting of unobstructed shifting of one carriage past the other carriage.

3,945,199

FLYWEIGHT SPEED SENSOR

Floyd P. Bradley, Windsor, and Lawrence S. Smith, Simsbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

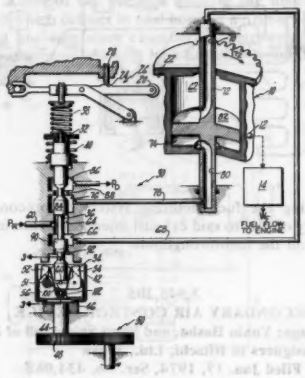
Filed Dec. 19, 1974, Ser. No. 534,336

Int. Cl.² F02C *9/08*

U.S. Cl. 60—39.28 R **8 Claims**

1. A fuel control for a turbine type power plant having a computer section including a speed sensor for monitoring said power plant's operating parameters for scheduling the flow of fuel to said power plant during acceleration and steady state conditions of said power plant, said computer section also provided an emergency schedule at the low speed spectrum of the entire operating schedule, said speed sensor including a pilot valve, means acting on said pilot valve to urge it in a first direction, at least two rotatably and pivotally mounted flyweights adjacent said pilot valve, means for imparting rotary action to said flyweights to urge said pilot valve in a direction opposite to said first direction in response to centrifugal force

on said flyweights resulting from said rotary motion, and means biasing said flyweights to produce a force thereon



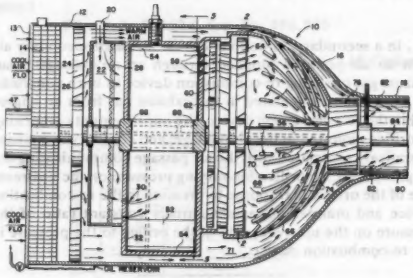
urging said pilot valve in said opposite direction for providing the power plant speed value at which said computer section switches from and to said emergency schedule.

3,945,200

ROTARY ENGINE AND TURBINE ASSEMBLY

Charles H. Wright, P.O. Box 367, Sand Hill, Miss. 39161

Filed July 16, 1974, Ser. No. 488,990
Int. Cl.² F02G *3/00*, *5/00*
U.S. Cl. 60—624 **9 Claims**



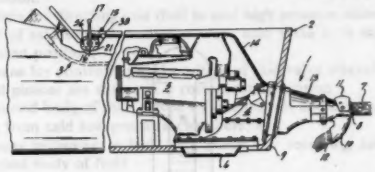
1. Apparatus comprising a rotary engine and a multi-stage turbine mounted on a common shaft, said rotary engine comprising a housing containing a plurality of rotating radially extending vanes, extension means telescoping within the ends of said vanes and having ends thereof maintained in engagement with the inner surface of said housing during rotation of said vanes, said shaft being offset relative to the center of said engine housing, said multi-stage turbine comprising a first set of rotary blades, a second set of rotary blades, and a set of stationary blades disposed on said shaft between said first and second sets of rotary blades, means to pass exhaust gas from said engine through said turbine, a housing containing a chamber receiving the exhaust gases passed through said turbine, a plurality of nozzles disposed around the periphery of said chamber for introducing air into the exhaust gases in said chamber, and discharge means at one end of said chamber.

3,945,201

MARINE JET DRIVE SHIFT CONTROL APPARATUS

David C. Entringer, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jan. 27, 1975, Ser. No. 544,375
Int. Cl.² B63H *25/46*
U.S. Cl. 60—222 **18 Claims**



1. A remote shift control assembly for a marine jet drive system having a diverting control element including movable input means for adjustably positioning thereof, comprising a support means, a moveable shift means moveably mounted to said support means and having means adapted to be coupled to said moveable input means for moving the input means from an initial position, a releasable holding means having interacting elements secured to said moveable shift means and said support means and establishing a releasable holding of said moveable shift means in the initial position, at least one of said interacting elements being moveable in a path parallel to the element secured to the moveable shift means to permit setting of the interacting elements in any one of a plurality of initial positions of said shift means, and releasable locking means to hold the moveable interacting element in said adjusted position.

3,945,202

ROCKET CONTAINING LEAD OXIDIZER SALT-HIGH DENSITY PROPELLANT

Frank A. Marion, and Hugh J. McSpadden, both of Riverside, Calif., assignors to Universal Propulsion Co., Riverside, Calif.

Continuation of Ser. No. 67,494, Aug. 27, 1970, abandoned. This application Nov. 5, 1973, Ser. No. 412,871
Int. Cl.² C06D *5/06*
U.S. Cl. 60—253 **14 Claims**

1. In combination for producing propulsion,

a closed combustion chamber having a hollow configuration and including a restricted throat opening to the atmosphere to provide for the passage of combustion gases from the combustion chamber to the atmosphere through the restricted throat,

a propulsion-producing material disposed in the combustion chamber and having properties of being combusted to produce combustion gases in the absence of atmospheric oxygen in the member and of passing the combustion gases into the atmosphere through the restricted throat in the combustion chamber to produce propulsion of the combustion chamber,

the propulsion-producing material including:

a binder providing hydrocarbon linkages,

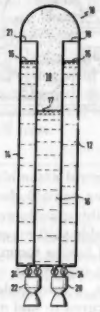
a lead compound oxidizer formed from inorganic lead oxidizer salts and having dense characteristics and stable properties at ambient temperatures and through a particular temperature range above ambient, and

a particulate metal fuel additive having properties of being oxidized by the oxidizer, the binder having a range of percentages by weight between eight percent (8%) and seventeen percent (17%) and the particulate metal fuel additive having a range of percentages by weight between eight percent (8%) and thirty percent (30%) and the remainder constituting the oxidizer.

3,945,203
LIQUID-FUELED ROCKET

Lutz Tilo Kayser, Am Bismarckturm 10, D-7 Stuttgart 1, Germany

Filed Oct. 4, 1973, Ser. No. 403,607
Claims priority, application Germany, Oct. 6, 1972, 2249081
Int. Cl.² F02K 9/02
U.S. Cl. 60—259 6 Claims



1. In a liquid-fueled rocket, a combination comprising propulsion means including a combustion chamber; enclosed container means for accommodating the fuel components of a liquid fuel and including two container portions; a membrane separating said portions; normally closed valve means interposed between said combustion chamber and said container means; fuel components of a liquid fuel in said container means and only in part filling the same, one of said fuel components being accommodated in one of said container portions and another of said fuel components being accommodated in the other of said container portions; and a body of gas confined in said container means in one of said container portions only and having a pressure in excess of the pressure in said combustion chamber so that when said valve means is opened the pressure differential due to the difference between the pressure of said gas and the pressure in said combustion chamber causes tearing of said membrane and flow of the fuel components from both of said container portions into said combustion chamber.

3,945,204
PROCESS FOR THE DETOXIFICATION OF EXHAUST GASES

Heinrich Knapp, Leonberg-Silberberg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

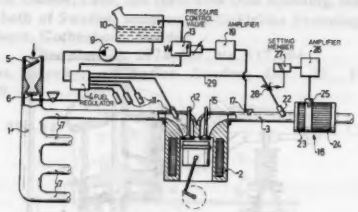
Filed June 27, 1974, Ser. No. 483,816
Claims priority, application Germany, June 29, 1973, 2333072
Int. Cl.² F02B 75/10
U.S. Cl. 60—274 3 Claims

1. A process for the detoxification of the exhaust gases of an internal combustion engine which includes a fuel metering system controlled by a first oxygen measuring sensor disposed in the exhaust system of the engine, comprising the steps of:

a. controlling the fuel metering system so that the ratio of the mass of the air to the mass of the fuel tends to a nominal value for which λ equal 1.02;

b. providing exhaust injection means for injecting supplementary fuel into the exhaust system of the engine;

c. providing a second oxygen measuring sensor in the exhaust system of the engine for the purpose of controlling the quantity of fuel injected by said exhaust injection means; and

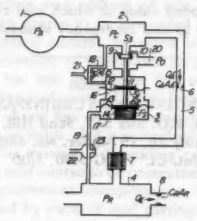


d. adjusting the fuel metering system to precontrol the delivery of fuel to said exhaust injection means in dependence on the fuel-throughput.

3,945,205
SECONDARY AIR CONTROL DEVICE

Takeshi Atago; Yukio Hosho, and Shoji Shimo, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 17, 1974, Ser. No. 434,062
Claims priority, application Japan, Jan. 22, 1973, 48-8598
Int. Cl.² F02B 75/10
U.S. Cl. 60—289 7 Claims



1. In a secondary air control device in which secondary air from an air pump is supplied through an air passage to an exhaust gas purifying re-combustion device to burn combustible components contained in the exhaust gas from an engine within the re-combustion device, the improvement comprising an orifice mounted in the air passage, and control valve means operatively associated with the air passage communicating the air pump with the orifice for varying pressure on the upstream side of the orifice in response to pressure in the re-combustion device and maintaining a substantially constant ratio of the pressure on the upstream side of the orifice to the pressure in the re-combustion device.

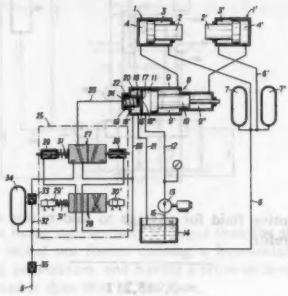
3,945,206
CONTROL SYSTEM FOR HYDRAULIC PRESSES COMPRISING A PLURALITY OF PRESS RAMS

Alfred Walter Joachim Krause, deceased, late of Munich, Germany (by Ilse Krause, heiress), assignor to Ruthner Industrieanlagen-Aktiengesellschaft, Vienna, Austria

Filed Mar. 24, 1975, Ser. No. 561,214
Int. Cl.² F15B 3/00, 11/16
U.S. Cl. 60—374 5 Claims

1. A control system for hydraulic presses comprising a plurality of press rams, which are movable in a forward direction toward each other and in a rearward direction away from each other in alternation, comprising a high-pressure conduit and a low-pressure conduit, said high-pressure conduit incorporating an intensifier and communicating with first chambers, which are associated with respective press rams and adapted to apply pressure to said press rams so as to urge them in said forward direction, said low-pressure conduit communi-

cating with second chambers, which are associated with respective press rams and adapted to apply pressure to said press rams so as to urge them in said rearward direction, said intensifier comprising a piston which is displaceable in a housing under the action of the pressure fluid in the high-pressure conduit and which defines in said housing a primary chamber and at least one secondary chamber, said primary chamber being constantly supplied with high-pressure liquid from said



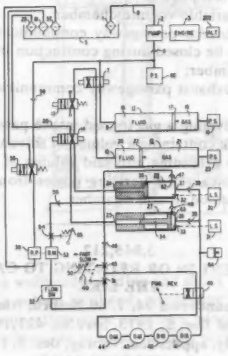
high-pressure conduit throughout the operation of the press, said secondary chamber communicating with said first chambers associated with said press rams, said primary chamber being connected by a first valve to a control conduit, and a second valve being provided, which is adapted to connect said control conduit in alternation to said low-pressure conduit and a return conduit in synchronism with the reciprocating motion of said press rams.

3,945,207

HYDRAULIC PROPULSION SYSTEM

James Ervin Hyatt, 206 B Marlboro Road, Old Bridge, N.J. 08857

Filed July 5, 1974, Ser. No. 486,005
Int. Cl.² F15B *1/02, 3/00*
U.S. Cl. 60—416 **10 Claims**



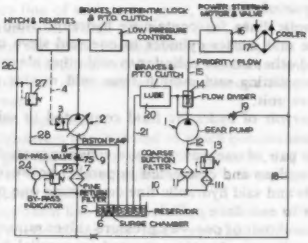
1. An energy transmission system comprising
a. a motive power
b. a reservoir containing a first body of fluid,
c. first and second volume multipliers each having a high pressure chamber, a low pressure chamber and a piston separating said chambers, said pistons of said first and second multipliers arranged for movement independent of each other,
d. a valve having first and second positions,
e. a pump driven by said prime mover arranged to supply fluid from said reservoir through a pump output to said valve,
f. means for directing said fluid to said high pressure chamber of said first multiplier when said valve is in said first position,
g. means for directing said fluid to said high pressure chamber of said second multiplier when said valve is in said second position,
h. means for controlling said position of said valve whereby said pistons are driven in a reciprocating motion,
i. a second body of fluid driven by said pistons and emanating from said low pressure chambers, and
j. means including at least one motor for receiving said second body of fluid.

3,945,208

FILTRATION FOR INTEGRATED TRACTOR HYDRAULIC SYSTEM

John W. O'Connor, Hales Corners, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jan. 2, 1974, Ser. No. 429,780
Int. Cl.² F16D *31/04*
U.S. Cl. 60—420 **10 Claims**

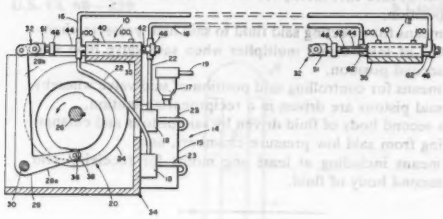


1. A hydraulic system including, a fluid reservoir, a constant displacement pump, a fluid supply filter connected between the low pressure side of said constant displacement pump and said reservoir, at least one hydraulic fluid motor connected to the high pressure side of said constant displacement pump, a variable displacement pump including a pressure compensator, at least one hydraulic fluid actuator connected to the high pressure side of said variable displacement pump, means connecting said pressure compensator to said hydraulic fluid actuator to vary the displacement of said variable displacement pump responsive to load pressures on said hydraulic fluid actuator, a fluid return filter connected on one side to the return side of said hydraulic fluid motor and to the return side of said hydraulic fluid actuator and on the other side to the low pressure side of said variable displacement pump for filtering returned hydraulic fluid supplied to said variable displacement pump, a surge tank in communication with said fluid reservoir, a hydraulic conduit means connected to said surge tank and connected between said return filter and said variable displacement pump to provide a filtered reserve supply of hydraulic fluid to compensate for variations of flow rate between said return filter and said variable displacement pump.

3,945,209
HYDRAULIC LINKAGE

Robert G. Dexter, 68 Laurel Lane, Lunenburg, Mass. 01462

Filed Oct. 4, 1974, Ser. No. 512,141
Int. Cl.² F15B 7/00
U.S. Cl. 60—546 10 Claims



1. A hydraulic linkage for transmitting reciprocating motion comprising:

a master unit,

a slave unit,

said master and slave units each comprising a pair of cylinders and a pair of interconnected rod pistons reciprocally moveable within said cylinders in opposite directions upon the application of a force to each said pair of pistons,

hydraulic lines for containing hydraulic fluid connecting one said master cylinder to one said slave cylinder and said other master cylinder to said other slave cylinder for transmitting said motion from said master unit to said slave unit,

a reservoir of hydraulic fluid connected to said hydraulic lines,

a first pair of one-way pressure valves mounted in opposite directions and connected in parallel between said reservoir and said hydraulic line connecting one master cylinder to one slave cylinder, and

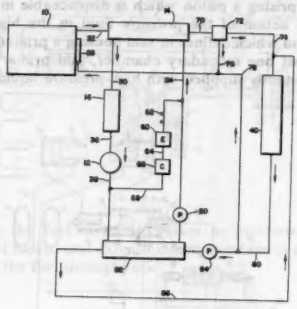
a second pair of one-way pressure valves mounted in opposite directions and connected in parallel between said reservoir and said hydraulic line connecting said other master cylinder to said other slave cylinder, so that volumetric increases in said hydraulic fluid in said lines and cylinders will be forced out through a first valve of each pair of pressure valves and pass to said reservoir, and volumetric decreases in said fluid in said lines and cylinders will draw fluid from said reservoir through a second valve of each pair of pressure valves, thereby providing volume change compensation.

3,945,210
ENERGY RECOVERY

Bryan W. Chapin, Union Springs, N.Y., assignor to Rodina Energy R & D Corporation, Auburn, N.Y.

Filed June 7, 1974, Ser. No. 477,207
Int. Cl.² F01K 23/06
U.S. Cl. 60—618 5 Claims

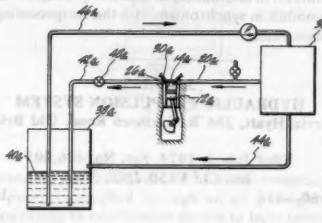
1. A secondary power system for recovering the waste heat energy of the coolant in a primary power system comprising: means forming a closed motive fluid circuit, said circuit containing motive fluid and, in series, a pump, a preheater, an evaporator, a motor and a condenser; means for passing a portion of said coolant directly from said primary system through said preheater in heat exchange relation with said motive fluid, and means for passing another portion of said coolant directly from said primary system through said evaporator in heat exchange relation with said motive fluid to vaporize said motive fluid for passage to said motor as a power source therefor.



3,945,211
VACUUM ENGINE

Bernard D. Rowe, 4312 Babcock Ave., Los Angeles, Calif. 91604

Filed May 2, 1974, Ser. No. 466,189
Int. Cl.² F01K 25/06
U.S. Cl. 60—649 10 Claims



1. An engine comprising:

at least one variable volume chamber;

a controlled intake passageway communicating with said chamber to be closed during contraction of said variable volume chamber;

a controlled exhaust passageway communicating with said chamber;

means for providing a gas to said intake passageway;

a solution tank containing a volume of solvent, said exhaust passageway extending into said volume of solvent; and

power train means for deriving power from the vacuum which is created in said chamber.

3,945,212
ARRANGEMENT IN OR RELATING TO CAISSONS OR THE LIKE

Olav Mo, Gronsundveien 94, 1360 Nesbru, Norway

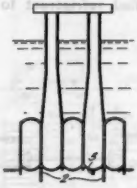
Filed Dec. 5, 1973, Ser. No. 421,794
Claims priority, application Norway, Dec. 5, 1972, 4472/72
Int. Cl.² E02D 23/08
U.S. Cl. 61—46.5 15 Claims

5. A marine structure of the type for being firmly secured to the sea floor for supporting a deck, comprising:

a large base having a large cross-section and weight, intended to rest on the sea floor, a superstructure projecting up from the base and extending up above sea level and supporting the deck,

a skirt attached to the base and extending downwardly therefrom, said skirt being sufficiently thin and having a height extending below the base such that it penetrates the sea floor to a depth which is sufficient to transfer to the sea floor main sea forces caused by the motion of the sea water so that the marine structure is stable against movement under the action of such forces,

pile means attached to the marine structure and extending downwardly below the bottom of the said skirt, said pile



means being substantially stronger than the skirt to withstand initial sea forces causing a horizontal movement during penetration, and having a cross-section considerably smaller than that of the base,

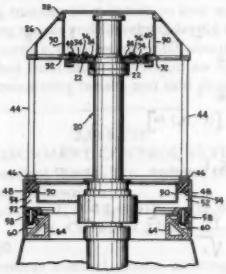
whereby the pile means engage the sea floor to reduce horizontal movement of the marine structure in the installation phase under the action of said initial sea forces before the bottom of the skirt engages the sea floor, so that the skirt can move downwardly into the sea floor to said stable depth.

3,945,213

SUBSEA WELLHEAD SHIELDING AND SHOCK MITIGATING SYSTEM

Gordon B. Forbes, San Jose, and Roland W. Van Houten, Palo Alto, both of Calif., assignors to Subsea Equipment Associates Ltd., Hamilton, Bermuda

Filed May 8, 1974, Ser. No. 467,878
Int. Cl.² B63C *11/00*
U.S. Cl. 61—69 R **6 Claims**



1. A subsea wellhead shielding and shock mitigating system for use with a subsea wellhead, comprising:

a. a first supporting guide structure adapted to be secured to the wellhead in at least partially surrounding relationship;

b. a second, outer structure operative to be pivotally secured to said first structure and adapted to enclose the wellhead; and

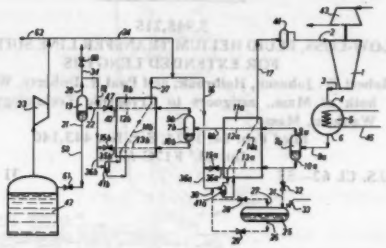
c. biasing means disposed between said second outer structure and said wellhead for biasing them with respect to each other, whereby the wellhead is shielded by said first and said second structures against impact from objects.

3,945,214

METHOD AND APPARATUS FOR COOLING A GAS

Bernard Darredeau, Montreal, Canada; Pierre Cappiello, Boulogne, and Herve Le Bihan, Vitry-sur-Seine, both of France, assignors to Societe des Procedes l'Air Liquide et Technip de Liquefaction des Gaz Naturels, Paris, France

Filed July 3, 1974, Ser. No. 485,535
Claims priority, application France, July 3, 1973, 73.24328
Int. Cl.² F17C *13/00*
U.S. Cl. 62—54 **18 Claims**



1. An open-type frigorific system for liquefying at least a light fraction of a mixture of gas to be cooled and liquefied, comprising in combination:

a. a compressor the suction and the delivery lines of which are, respectively, at a low pressure and a higher pressure,

b. a condenser the inlet of which communicates with the delivery line of said compressor, and the outlet of which communicates with a two-phase inlet of a first separator of a first fractional condensation module,

c. said first fractional condensation module comprising in the direction of circulation of a gaseous mixture to be condensed:

said first separator,

a condensation line, one end of which communicates with the gaseous outlet of said first separator, and the other end of which communicates with a two-phase inlet of a second separator,

a vaporization line in heat exchange relation with at least said condensation line, said vaporization line communicating at one extremity thereof with a gaseous outlet of the vaporization line of a second fractional condensation module, and at the other extremity thereof with the suction line of said compressor,

at least one expansion valve communicating on the upstream side with the liquid outlet of said first separator, and on the downstream side with said vaporization line,

d. a second fractional condensation module comprising in the direction of circulation of a gaseous mixture to be condensed:

said second separator,

a second condensation line, one end of which communicates with the gaseous outlet of said second separator, and the other end of which communicates with a two-phase inlet of a third separator,

a second vaporization line in heat exchange relation with at least said second condensation line, said vaporization line communicating at one extremity thereof with an inlet of the vaporization line of the first fractional condensation module,

at least one expansion valve communicating on the upstream side with the liquid outlet of said second separator, and on the downstream side with the inlet of said second vaporization line,

e. a gas supply conduit communicating with at least one of said vaporization lines, and supplied with said light fraction of mixture of gas to be liquefied,

f. a conduit for the extraction of said liquefied fraction communicating with the liquid outlet of said third separator,

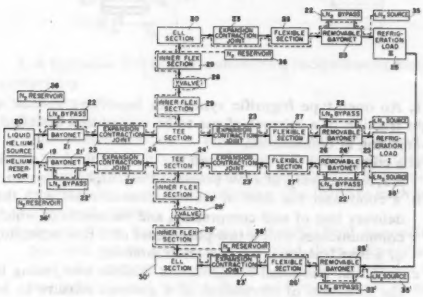
g. a storage vessel associated with at least one of said condensation modules, having an inlet line communicating with at least one liquid outlet of a said separator, and having at least one outlet line communicating with at least a said vaporization line, said storage vessel being at least partially filled with a liquefied gas having a normal boiling point at least 70°C. higher than that of a main constituent of said light fraction of said gas mixture to be liquefied.

3,945,215

LOW-LOSS, FLUID HELIUM TRANSFER LINE SUITABLE FOR EXTENDED LENGTHS

Robert W. Johnson, Holbrook, and Paul R. Doherty, Woburn, both of Mass., assignors to Cryogenic Technology, Inc., Waltham, Mass.

Filed Feb. 14, 1974, Ser. No. 443,140
Int. Cl.² F17C 17/02
U.S. Cl. 62—55 **31 Claims**



1. A fuild helium transfer line capable of transferring fluid helium between first and second terminals over extended distances with low loss, comprising in combination

a. a helium process line;

b. radiation shielding means surrounding said process line throughout essentially the entire length of said process line and defining a first annular spacing therewith;

c. cryogenic coolant transfer line means for circulating a cryogenic coolant in indirect heat exchange with said radiation shielding means;

d. vacuum jacketing means defining an evacuatable volume around said process line, said radiation shielding means and said coolant transfer line means, said evacuatable volume including a second annular spacing between said radiation shielding means and said vacuum jacketing means;

e. expansion-contraction joint means in said radiation shielding means and said coolant transfer line means; and

f. heat-stationed bayonet connector means terminating each end of said transfer line and arranged to connect said transfer line at said first and second terminals.

3,945,216

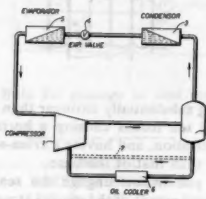
REFRIGERATION SYSTEMS

Hjalmar Schibbye, Saltsjo-Boo, Sweden, assignor to Svenska Rotor Maskiner Aktiebolag, Nacka, Sweden

Continuation-in-part of Ser. No. 480,400, June 18, 1974, abandoned. This application Dec. 16, 1974, Ser. No. 533,161
Claims priority, application United Kingdom, June 18, 1973, 28742/73
Int. Cl.² F25B 43/02
U.S. Cl. 62—84 **44 Claims**

1. Refrigeration apparatus comprising in combination:

an oil injected helical screw compressor for compressing gaseous halocarbon refrigerant, an oil separator connected to said compressor to receive a mixture of compressed gaseous refrigerant and oil containing dissolved refrigerant for separating said compressed gaseous refrigerant from said oil containing dissolved refrigerant, a condenser connected to said oil separator to receive said compressed gaseous refrigerant for liquifying said refrigerant, an evaporator connected to said condenser by a conduit means containing an expansion valve for evaporating said liquified refrigerant to the gaseous state,



means for returning said evaporated gaseous refrigerant to the suction end of said compressor, and means for recycling said oil containing dissolved refrigerant to said compressor,

said compressor having a male rotor and a female rotor, said male rotor having a diameter of up to about 105 mm and means for being rotated to provide a male rotor tip speed of between about 5 and 30 m/sec, said compressor having a discharge pressure of between about 10 and 30 kp/cm²,

the dielectric constants of said oil ($\epsilon_{r\ oil}$) and said liquified refrigerant ($\epsilon_{r\ gas}$), and the viscosity of the oil, satisfying the following relationships

$$\left| \ln \epsilon_{r_{gas}} - \ln \epsilon_{r_{oil}} \right| = x$$

and when $x \geq 1$

$$v = \gamma \cdot e^{\left[(c \cdot p_1)/u\right]}$$

and when $x < 1$

$$v = \frac{\gamma}{\sqrt{x}} e^{\left[(c \cdot p_1)/u\right]}$$

wherein Y is a value between 25 and 200, ln is the natural logarithm, ϵ_r is the dielectric constant at 50°C, v is the kinematic viscosity of the pure oil in centistokes at 50°C, P_1 is the discharge pressure of the compressor, u is the tip speed of the male rotor, e is the base of the natural system of logarithms, and c is a constant equal to

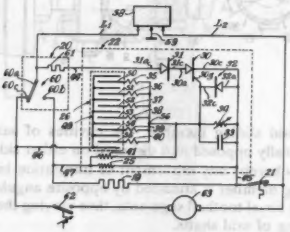
$$1 \frac{cm^2 \cdot m}{kp \cdot sec}$$

when P_1 is measured in kp/cm² and u is measured in m/sec.

3,945,217
REFRIGERATION SYSTEM DEFROST CONTROL

Larry T. Bashark, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Apr. 4, 1974, Ser. No. 457,759
Int. Cl.² F25D 21/08
U.S. Cl. 62—151 40 Claims



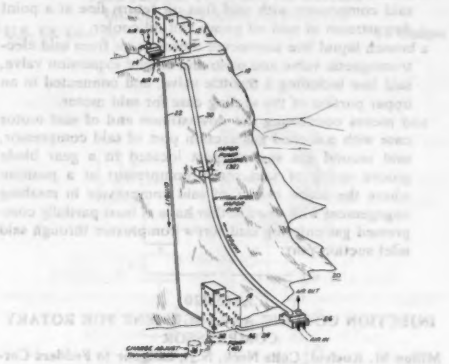
1. Improved control means adapted to be responsive to humidity conditions of refrigerated air in a refrigeration system for controlling the operation of the refrigeration system defrost means, comprising: moisture sensing and accumulating means defining a variable electrical resistance varying as an inverse function of the amount of moisture absorbed thereby; means defining a closed chamber confronting said moisture sensing and accumulating means; circuit means responsive to said variable resistance including a thermal relay having a heater element and a switch for controlling the defrosting operation, and means responsive to said resistance reaching a preselected low resistance for actuating said heater element; and means providing controlled communication between said chamber and the refrigerated air including absorption means spaced from said moisture sensing and accumulating means for absorbing moisture from the refrigerated air for retarding transfer of moisture to said moisture sensing and accumulating means and thereby delaying the dropping of said resistance until a preselected total amount of moisture has been absorbed from said refrigerated air by said moisture sensing and accumulating means and said absorption means.

3,945,218
ENVIRONMENT CONTROL SYSTEM

Sidney A. Parker, Fort Worth, Tex., assignor to Lennox Industries, Inc., Marshalltown, Iowa

Filed Jan. 2, 1975, Ser. No. 538,010
Int. Cl.² F25B 27/00
U.S. Cl. 62—260 12 Claims

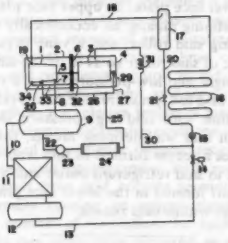
1. An environment control system utilizing the elevation difference between a higher elevation and a lower elevation and available temperatures on the earth's surface comprising heat rejection means at a higher elevation, heat supply means at a lower elevation, refrigerant expansion means at substantially the same level as the heat supply means, relatively small diameter conduit means communicating the heat rejection means and the refrigerant expansion means and the heat supply means respectively, relatively large diameter insulated conduit means communicating the heat supply means with the heat rejection means, the elevation difference creating a pressure head of liquid refrigerant in said small diameter conduit means and charge adjustment means for controlling flow of fluid to or from the system to optimize operation depending on said charge adjustment means including pump means, whereby liquid refrigerant flowing through the relatively small diameter conduit means is expanded through said expansion means and vaporized and cooled and the cool vaporized refrigerant will absorb heat from the heat supply means and flow to the heat rejection means.



3,945,219
METHOD OF AND APPARATUS FOR PREVENTING OVERHEATING OF ELECTRICAL MOTORS FOR COMPRESSORS

Keisuke Kasahara, Tokyo, Japan, assignor to Kabushiki Kaisha Maekawa Seisakusho, Tokyo, Japan

Continuation of Ser. No. 409,059, Oct. 24, 1973, abandoned, which is a continuation of Ser. No. 171,923, Aug. 16, 1971, abandoned. This application Dec. 9, 1974, Ser. No. 531,068
Claims priority, application Japan, Aug. 25, 1970, 45-74422
Int. Cl.² F25B 43/02
U.S. Cl. 62—469 1 Claim



1. A compressor system including apparatus for preventing overheating of an electric motor for a compressor, comprising

a rotary screw compressor,

an electric motor of the closed type having a rotary shaft connected to a rotary shaft of said screw compressor for driving said compressor, and a sealing case for housing said electric motor,

an oil separator connected to an outlet port of said compressor,

a condenser, the top portion of which is connected to an upper portion of said oil separator, said condenser also connected to an inlet suction port of said compresser by means including:

a high pressure receiving vessel, an electromagnetic valve, an expansion valve, an evaporator, and a liquid separator, which are respectively connected in series in said order,

and a liquid return line including a check valve connected between said liquid separator and said evaporator;

a first oil return line including an oil pump and an oil cooler, connecting said oil separator and said motor,

a second oil return line connecting an oil ejection port of said compressor with said first oil return line at a point downstream of said oil pump and oil cooler,

a branch liquid line connected downstream from said electromagnetic valve and upstream of said expansion valve, said line including a throttle valve, and connected to an upper portion of the sealing case for said motor,

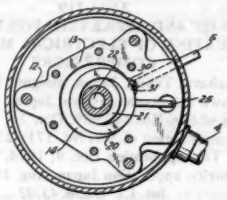
and means connecting the downstream end of said motor case with a second gas suction port of said compressor, said second gas suction port located in a gear blade groove space of said screw compressor at a position where the screw blades of said compressor in meshing engagement with one another have at least partially compressed gas entering said screw compressor through said inlet suction port.

3,945,220

INJECTION COOLING ARRANGEMENT FOR ROTARY COMPRESSOR

Milton M. Kosfeld, Colts Neck, N.J., assignor to Fedders Corporation, Edison, N.J.

Filed Apr. 7, 1975, Ser. No. 565,844
Int. Cl.² F25B 31/00
U.S. Cl. 62—505 **4 Claims**



1. In a rotary compressor having a compression chamber formed by a lower face plate, an upper face plate, an an intermediary wall-defining means, an eccentrically driven roller, a motor for driving said roller, and a vane urged into contact with the surface of said roller so as to divide said compression chamber into high- and low-pressure sides, a refrigerant inlet in contact with said low-pressure side, and a refrigerant outlet in communication with said high-pressure side, said outlet connecting with said wall-defining means, the improvement which comprises a recess formed in said wall-defining means at the entrance to said refrigerant outlet and a liquid refrigerant injection port formed in the lower face plate of said compressor chamber within said recess.

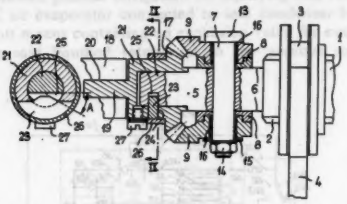
3,945,221

SHAFT COUPLING WITH VARIABLE TIMING

Stevan Miokovic, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jan. 16, 1975, Ser. No. 541,574
Claims priority, application France, Jan. 21, 1974, 74.01886
Int. Cl.² F16D 3/10
U.S. Cl. 64—24 **5 Claims**

1. Device for coupling together two coaxial rotary shafts and permitting of varying within certain limits the relative angular timing of said shafts under running conditions, notably for driving the valves of internal combustion engines, which comprises a sliding member adapted to move axially in relation to said shafts for varying their relative angular timing, said device further comprising a bevel gear rotatably integral with one shaft, at one end thereof, a pair of toothed segments having bevel teeth in constant meshing engagement with diametrally opposed portions of said bevel gear, said segments being pivoted by means of a diametral pin carried by the other shaft, each bevel-toothed segments being rotatably solid with a lever having a fork-shaped cavity engageable by a driving pin



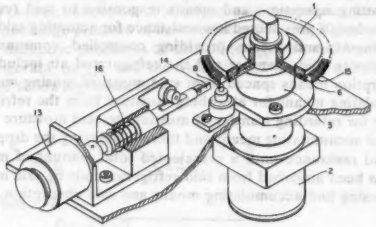
carried by said sliding member, the cavities of said levers being diametrally opposed and disposed on either side of said other shaft, whereby any movement of translation impressed to said sliding member is attended by opposite angular movements of said bevel toothed segments, thus varying the relative angular timing of said shafts.

3,945,222

APPARATUS FOR SETTING A PATTERN TO A PATTERN WHEEL IN A CIRCULAR KNITTING MACHINE

Fukuo Matsumoto; Kikuo Kondo, and Masao Shibata, all of Aichi, Japan, assignors to Toray Textiles, Inc., Tokyo, Japan

Filed Dec. 3, 1973, Ser. No. 421,141
Claims priority, application Japan, Dec. 29, 1972, 48-1126
Int. Cl.² D04B 37/04
U.S. Cl. 66—1 R **7 Claims**



1. In an apparatus for applying a pattern through a tape reader to a rotatable pattern wheel having a plurality of spaced-apart blades for a circular knitting machine, said blades constituting walls between which jacks are movably confined, the combination which comprises means supporting said pattern wheel, said means including a holding member, a high-frequency proximity switch for detecting the positions of the blades of said pattern wheel and for transmitting a signal, said proximity switch including a pick-up head arranged and positioned near said pattern wheel and operatively associated with said blades to detect the proximity thereof to said pick-up head, a first blade adjacent to said pick-up head, a first jack adjacent to said first blade and operative for setting the pattern of said pattern wheel, a presser connected for pushing said jack radially inwardly of the pattern wheel, means for advancing said presser to push said first jack just after the time when said first blade is detected by said proximity switch and then retracting said presser before the next successive blade is detected by said proximity switch, and means for transmitting said signal from said proximity switch through said tape reader and to said presser actuating means.

3,945,223

APPARATUS AND METHOD OF KNITTING AND ELEMENTS THEREOF

Morris Philip, 2519 Grand Ave., Bronx, N.Y. 10468

Continuation of Ser. No. 315,237, Dec. 14, 1972, abandoned. This application Apr. 4, 1975, Ser. No. 565,226
Int. Cl.² D04B 9/00, 15/74, 15/76, 15/78
U.S. Cl. 66—50 R 54 Claims

1. In a multifeed knitting machine, a needle bed having a plurality of laterally spaced apart longitudinally extending needle grooves, each of at least some of said grooves having positioned therein an arrangement comprising a jack, a knitting needle corresponding thereto, and a movement multiplier rocker between said jack and needle for transmitting the movement of said jack to said needle while multiplying the length thereof,

a. said jack being slidably mounted in said groove for forward-rearward reciprocation and having adjacent its forward end inwardly extending means defining a forwardly facing jack contact for abutting said rocker to transmit the movement of said jack to said rocker,

b. said needle being slidably mounted in said groove forwardly of said jack for forward-rearward reciprocation and having outwardly extending butt means thereon,

c. rearwardly facing needle contact means for abutment by said rocker to receive the movement of said rocker and to transmit said rocker movement to said needle,

d. said rocker having an inner portion, an outer portion and an intermediate portion therebetween,

e. said intermediate portion of said rocker having at the rear thereof a rearwardly facing first rocker contact for abutment by said jack contact to receive the movement of said jack,

f. said outer portion of said rocker having a forwardly facing second rocker contact for abutting said needle contact means to transmit movement of said forward portion of said rocker to said needle,

g. means pivotally mounting said inner portion in said needle bed about a pivot axis inwardly of said first rocker contact so that said first and second rocker contacts can oscillate forwardly-rearwardly about said pivot axis,

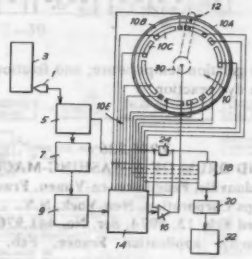
h. whereby when said jack is moved forwardly said jack contact abuts said first rocker contact to pivot said rocker forwardly to cause said second rocker contact to abut said needle contact means and urge said needle forwardly a greater distance than said jack was moved forwardly.

3,945,224

CONTROL SYSTEM FOR CIRCULAR KNITTING MACHINES AND THE LIKE

Giorgio Billi, Florence, Italy, assignor to Billi, S.p.A., Florence, Italy

Filed July 30, 1973, Ser. No. 383,480
Int. Cl.² D04B 9/00, 15/99, 15/16
U.S. Cl. 66—56 14 Claims



1. A control system for circular stocking machines and the like of the type including a needle cylinder, a programming cam drum, and control means to modify the cylinder speed between a minimum and a maximum rate, said system including:

a. a counting means for counting needle cylinder revolutions and generating pulses responsive to a prescribed number of revolutions, said counting means including a zero setting means;

b. a programming unit receiving the pulses from said counting means and including programming means for transmitting output signals responsive to a prescribed number of pulses from said counter;

c. a rotating member integrally connected with said programming cam drum and including electrical contact means, and a fixed member including a plurality of conductive arcuate segments successively engageable by said electrical contact means of said rotating member, said arcuate segments having output lines operatively connected to said programming unit to indicate drum position to said programming unit, said segments corresponding in length to the relative length of movements of said cam drum between successive positions; and

d. an assembly of coincidence circuits, receiving the output signals from said programming unit and receiving the output signals from said arcuate segments, said coincidence circuits causing an output signal after a programmed number of revolutions for each stopping position of said cam drum have occurred, so as to initiate the advance of said cam drum and said rotating member.

3,945,225

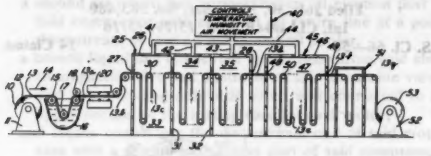
CONTINUOUS TEXTILE DYEING APPARATUS

Lyle E. McCoy, 533 N. Whitehall Road, Norristown, Pa. 19401

Division of Ser. No. 363,985, May 25, 1973. This application Aug. 29, 1974, Ser. No. 501,784
Int. Cl.² D06B 3/02, 9/02, 21/00
U.S. Cl. 68—5 D 5 Claims

1. Textile dyeing apparatus comprising: means for applying to textiles a mixture of dye, gelatin and solvent; cooling means for cooling the applied mixture to a temperature between the gelatin gelation temperature and the solvent freezing temperature; drying means for removing solvent and gradually raising the gelatin concentration; environmental control means for

gradually raising the temperature of the applied mixture during solvent removal and maintaining the web bulb tempera-



ture below the gelation temperature; and fixation means for completing the dye reaction.

3,945,226

TUB AND DRUM OF A WASHING-MACHINE

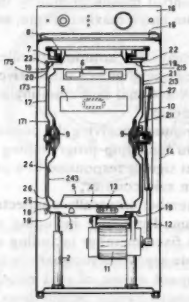
Philippe de Hedouville, Feuguieres-en-Vimeu, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 13, 1974, Ser. No. 441,970

Claims priority, application France, Feb. 19, 1973, 73.05799

Int. Cl.² D06F *23/02, 37/04, 37/22*

U.S. Cl. 68—23.1 **4 Claims**



1. A laundry washing and spin-drying machine having a high ratio of drum volume to housing width, comprising a housing, a tub, means for resiliently mounting said tub within said housing, a drum mounted within said tub for rotation about a horizontal axis, means for driving said drum at agitating speed for washing and at high speed for spin-drying, and means for obtaining access to the interior of the drum to insert and remove laundry, said tub comprising:

a cylindrical part having two end edges; two flanks, each of said flanks comprising a truncated conical surface extending outward, said truncated surface having a large base edge and a small base edge, said base edges lying in parallel planes, the large base edge of each flank adjoining a respective end edge of the cylindrical part, each flank further comprising a substantially planar surface having an outer edge fixed to said small base edge; and means for fixing each large base edge to the respective end edge, said fixing means being entirely located inwardly of the plane in which said small base edge lies,

whereby said fixing means has adequate clearance from said housing despite angular movements of said axis due to laundry unbalance during spin-drying.

3,945,227

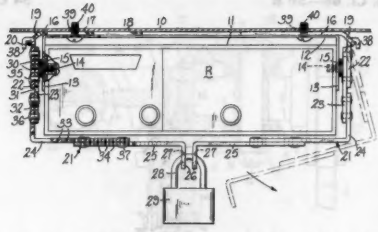
PROTECTIVE BRACKET

Peter M. Reiland, 13 Medley Lane, Branford, Conn. 06405

Filed Dec. 30, 1974, Ser. No. 537,208

Int. Cl.² E05B *73/00*

U.S. Cl. 70—58 **3 Claims**



1. A bracket for preventing removal of an article from a support on which it is mounted, comprising elements fixed to the support, elongated elements hinged to the fixed elements, releasable mounting devices securing the article to the support, the hinged elements being adapted to take a closed position preventing the release of said mounting devices, an elongated hanger for the supported article, means attaching the hanger to a support, and a lock for holding the hinged elements in closed position, the fixed elements being flat strips held between the hanger and the support, and having ends projecting beyond the ends of the hanger for hinged engagement with ends of the elongated elements, and the mounting devices being screws which connect the article to the hanger.

3,945,228

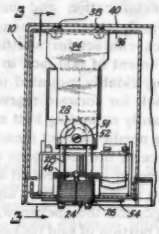
COIN-RECEIVING MECHANISM FOR VENDING MACHINES

H. Carl Voegeli, 918 Gibbs Road, Venice, Fla. 33595

Filed Feb. 21, 1975, Ser. No. 551,988

Int. Cl.² E05B *65/44*

U.S. Cl. 70—80 **5 Claims**



1. In a coin-operated vending machine including a coin-receiving enclosure having a front panel attached thereto allowing access to said enclosure and provided with a locking mechanism, the improvement comprising:

a. locking means having a lock body member including at least one axial aperture therein extending at least partially through said body member, and a cooperating lock shaft member adapted for insertion into said aperture for locking engagement therewith;

b. recess means having side walls and a bottom wall formed in said front panel receiving said lock body member and including apertures in said bottom wall corresponding with said aperture in said lock body member, said recess means receiving said lock body member in cooperating

relationship whereby only the outer end face of said lock body member is presented for access; and

c. means disposed interiorly said enclosure securely affixing said lock shaft member therein with said lock shaft member extending outwardly through said apertures in said recess into locking relationship with said lock body member, thereby securely affixing said front panel to said coin-receiving enclosure.

3,945,229

BAR-TUMBLER TYPE SAFETY LOCK

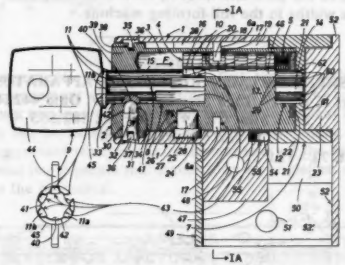
Roger Frank, rue General Ferrie, 74300-Cluses, France

Filed Dec. 27, 1973, Ser. No. 428,820

Claims priority, application France, Dec. 29, 1972, 72.46867

Int. Cl.² E05B *27/08*

U.S. Cl. 70—363 **13 Claims**



1. A bar-tumbler safety lock comprising:

a hollow body having an opening at a front end thereof,

a barrel shaped to move into the said opening in the body and rotatably mounted therein, a plurality of recesses extending longitudinally along an outward portion of the barrel, a bar-tumbler longitudinally slidable in each recess, in a first direction, and return means for opposing movement of the tumblers in said first direction, said bar-tumblers each including an operative notch therein,

a split washer located within the body at an operative position surrounding the barrel, the outer periphery of the washer engaging the body so as to be stationary against rotation relative to the body but movable longitudinally therein from said operative position to said opening, portions of the inner periphery of the washer being located inwardly of the outermost portions of the tumblers, but outwardly of the portions of said tumblers exposed by said operative notches, whereby when operative notches of the tumblers are longitudinally aligned with the washer, the barrel can rotate relative to the washer and the body,

a radially extending annular groove formed in the barrel at a location intermediate to the ends thereof and receiving said split washer therein, said annular groove opening into said recesses and permitting access to said tumblers when the barrel is removed from the body, the width of said groove being no greater than the widths of the operative notches of the tumblers,

a latch holder operatively engaged with the barrel to rotate therewith,

said barrel with said washer being movable as a unit out of said front opening of the body,

and a restraining means for preventing longitudinal movement of the barrel out the front opening of the body in the normal rest position of the barrel in the body and for releasing the barrel for removal longitudinally out of the body at a certain given rotary position of the barrel, angularly displaced from said normal rest position.

3,945,230

PROCESS FOR AUTOMATICALLY INTERCHANGING DIE ASSEMBLIES IN A METAL WORKING PRESS AND APPARATUS THEREFOR

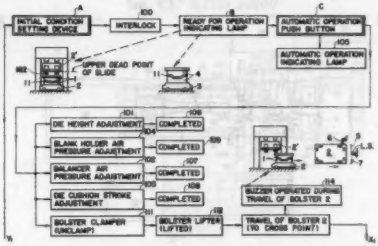
Shozo Tomioka, Komatsu; Shujiro Matsushima, Kanazawa; Yokichi Koezuka; Geniti Tanabe, both of Komatsu, and Koichi Nakasyo, Mikawa, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sept. 27, 1974, Ser. No. 509,907

Claims priority, application Japan, Sept. 27, 1973, 48-107999

Int. Cl.² B30B *15/00*

U.S. Cl. 72—30 **2 Claims**


INTERLOCK
READY FOR OPERATION INDICATING LAMP
AUTOMATIC OPERATION PUSH BUTTON
AUTOMATIC OPERATION INDICATING LAMP
UPPER DEAD POINT OF SLIDE
DIE HEIGHT ADJUSTMENT
BLANK HOLDER AIR PRESSURE ADJUSTMENT
BALANCER AIR PRESSURE ADJUSTMENT
DIE CUSHION STROKE ADJUSTMENT
BOLSTER CLAMPER (UNCLAMP)
BOLSTER LIFTER (LIFTED)
BUZZER OPERATED DURING TRAVEL OF BOLSTER 2
TRAVEL OF BOLSTER 2 (TO CROSS POINT)
COMPLETED

1. Process for automatically interchanging die assemblies, which assemblies are to be used in succeeding operations, in a metal working press in which a first moving bolster is located in a position in the press having mounted thereon a die assembly consisting of an upper die and a lower die which have been used in a preceding operation of the press with the slide of the press being located at the upper dead point thereof and a second moving bolster being located in a position exterior to the press having mounted thereon a die assembly consisting of an upper die and a lower die which are to be used in a succeeding operation of the press, wherein the improvement comprises the steps of adjusting the die assembly on the second bolster including effecting die height adjustment for providing a set clearance for the next die assembly, balancer air pressure adjustment, die cushion stroke adjustment and blank holder air pressure adjustment for the next die assembly according to predetermined set values set for the next operation of the press using the next die assembly on the second bolster upon receipt of an interlocking signal for operating the first and second moving bolsters, moving the first bolster out of the press into position exterior to the set position, moving the second bolster into position in the press, moving the slide which has been located at the upper dead point downwardly to the lower dead point for securing an adapter attached to the upper die mounted on the second bolster to the slide by the clamping action of a die clamper of the slide, moving the slide again to the upper dead point for simultaneously readjusting the die height for applying infeed or pressing force to the slide, lifting a die cushion pad and adjusting the die cushion air pressure, carrying out the pressing operation for producing products in accordance with a predetermined set number, moving the slide again to the upper dead point for adjusting the die height thereby providing a set clearance for the next die assembly, lowering the die cushion pad upon receipt of an interlocking signal for operation of the press and the first and second moving bolsters, moving the slide to the lower dead point for separating the adapter attaching thereto the upper die from the slide by the unclamping action of the die clamper, moving the slide to the upper dead point for readjusting the assembly, and interchanging the die assembly on the first moving bolster located in position at the exterior position with a succeeding die assembly to be used in a succeeding operation, wherein all of the steps are automatically carried out in accordance with a predetermined pattern thereby permitting

the changing of the die assemblies to be carried out automatically during the pressing operation by the press.

3,945,231

PROCESS AND APPARATUS FOR PREPARATION OF THIN WALLED CYLINDRICAL VESSELS

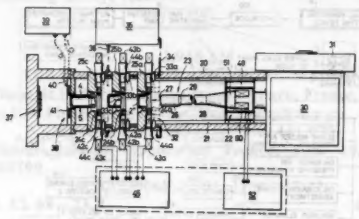
Katsuhiro Imazu, Yokohama, and Masao Miyata, Kawasaki, both of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan

Filed Oct. 29, 1974, Ser. No. 518,884

Claims priority, application Japan, Oct. 31, 1973, 48-121620; Sept. 18, 1974, 49-106786

Int. Cl.² B21C *9/00*; B21D *22/28*

U.S. Cl. 72—45 **19 Claims**



1. A process for the preparation of thin-walled cylindrical containers which comprises the steps of

a. inserting an ironing punch having an outer peripheral surface into the interior of a cup-llke formed article composed of a metal material, said outer peripheral surface having a slip-fitting engagement with the inner face of the side wall portion of the cup-like formed article,

b. engaging the side wall portion of the cuplike formed article supported by the ironing punch with a plurality of circular ironing dies disposed coaxially with the ironing punch thereby to elongate the side wall portion of the cup-like formed article and reduce the thickness of said side wall portion,

c. lubricating the side wall portion of the cup-like formed article by feeding a liquid lubricant at least to the part of the side wall portion to be elongated in advance of engagement thereof by a respective one of the ironing dies, and

d. simultaneously irradiating ultrasonic waves at least on said part of the side wall portion and thereby uniformly distributing the liquid lubricant on the side wall portion between the side wall portion being elongated and the associated ironing die.

3,945,232

ROLL-STAND FOR ROLL-FORMING MACHINE

Dan L. Colbath, P.O. Box 1003, Sherman, Tex. 75090

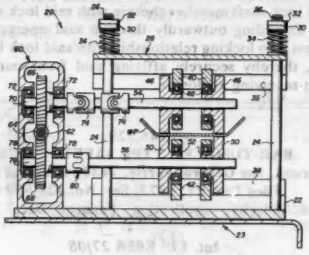
Continuation-in-part of Ser. No. 355,673, April 30, 1973, Pat. No. 3,823,592, which is a continuation-in-part of Ser. No. 181,838, Sept. 20, 1971, Pat. No. 3,748,884. This application Apr. 5, 1974, Ser. No. 458,295

The portion of the term of this patent subsequent to July 31, 1990, has been disclaimed.

Int. Cl.² B21D *5/08*

U.S. Cl. 72—181 **27 Claims**

1. In a roll-forming machine of the type including means defining the path of material to be formed, a plurality of die-stands positioned at spaced points along the path for progressively transforming material from an initial configuration to a desired configuration, and a plurality of roll-stands positioned at spaced points along the path for driving material therealong and through the die-stands, each of said roll-stands comprising at least one non-forming lower roller and power means for actuating the lower roller, the improvement comprising means for selectively locating at least the lower roller of each roll-stand in predetermined positions transversely with



respect to the path and thereby accommodating materials of various widths in the roll-forming machine.

3,945,233

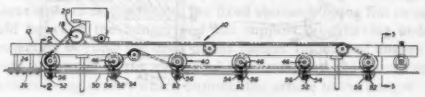
SHEET METAL STRIP ROLLER APPARATUS

Herbert F. Dewey, 1368 Mac Drive, Stow, Ohio 44224

Filed Mar. 27, 1975, Ser. No. 562,853

Int. Cl.² B21D *5/08*

U.S. Cl. 72—181 **6 Claims**



1. In a strip metal rolling apparatus, a frame means including opposed side members, several pairs of metal wheel members fixedly secured to opposed portions of said side members and depending therefrom, a shaft carrying an upper forming roll thereon journalled in and extending between each of said pairs of metal wheel members, a plurality of roll mounting bars, each secured to and extending between pairs of adjacent metal wheel members positioned on the same one of said side members, means securing each of said bars to said pairs of said wheel members for vertical adjusting movement, a positioning shaft carrying a lower forming roll thereon fixedly secured to and extending between opposed forward sections of a pair of laterally opposed bars and a second lower roll carrying shaft similarly secured to and extending between rearward portions of said bars, said upper and lower forming rolls being operatively associated in operative paris in the apparatus.

3,945,234

TANDEM ROLLING MILL ARRANGEMENT

Rolf Steinbock, 603 Lindsay Road, Carnegie, Pa. 15106

Filed Jan. 2, 1975, Ser. No. 538,111

Int. Cl.² B21B *13/12*

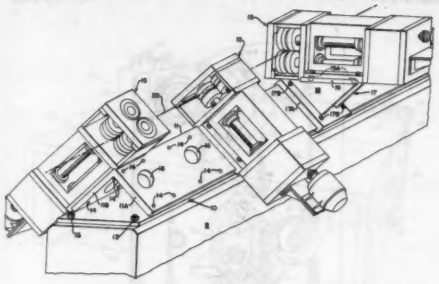
U.S. Cl. 72—235 **17 Claims**

1. An apparatus for providing alternative tandem arrangements of rolling mill stands to process workpieces by successive rolling operations along a given passline, said apparatus comprising, in combination:

a plurality of separate and independently operable rolling mill stand assemblies each including housing means to rotatably support a pair of rolling mill rolls which defines a roll gap wherein a workpiece is processed, and separate drive means including a motor for rotating the rolls of each rolling mill stand assembly; and

pedestal means defining a plurality of separate support surfaces each adapted to support and independently position one of said plurality of rolling mill stand assemblies at a preselected location along said passline, certain

of said support surfaces being at different angular positions with respect to others and each of said stand assemblies being removable from an associated one of said support surfaces independently of the others, said separate support surfaces define a support location by said pedestal means for each of said rolling mill stands to form part of at least two alternative tandem rolling mill ar-



rangements which include a first tandem rolling mill arrangement wherein the rotational axes of the rolls of at least two separate mill stands form an angle of at least 45° to the horizontal, and a second tandem rolling mill arrangement wherein the rotational axes of the rolls of at least two separate mill stands form an angle less than 45° to the horizontal.

3,945,235

APPARATUS FOR APPLYING A TENSILE LOAD TO A HOLLOW SHAFT

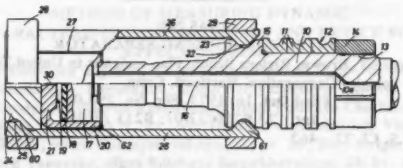
Roy Ronald Oxlade, and David James Westgarth, both of London, England, assignors to British Steel Corporation, London, England

Filed Feb. 27, 1975, Ser. No. 553,737

Claims priority, application United Kingdom, Mar. 8, 1974, 10554/74

Int. Cl.² B21B *31/08*

U.S. Cl. 72—238 **10 Claims**



1. Apparatus for applying a tensile load to a hollow shaft member having internal abutment means and external abutment means in order to longitudinally stretch said shaft member and reduce the diameter thereof, comprising:

a. a rod having an inner end which in use is inserted into said hollow shaft member and abutted against said internal abutment means to apply the load to the shaft member,

b. a piston carried by the other end of the rod which in use extends outside the shaft member,

c. a cylinder within which said piston is slidably moveable,

d. a reaction member spaced from but adjacent to the head of the piston in the direction away from said other end of said rod,

e. at least two rigid members which in use extend externally of said cylinder between said reaction member and the external abutment means on said shaft member, each rigid member being shaped at its ends so as to operably engage respectively the reaction member and the external abutment means on the shaft member,

f. means for holding the ends of said rigid members into operable, fixed engagement with the shaft member and reaction member, and

g. means for admitting a hydraulic fluid under pressure into said cylinder between the head of the piston and the reaction member to actuate said piston to thereby apply a tensile load to said shaft member and stretch it longitudinally and to reduce the diameter thereof.

3,945,236

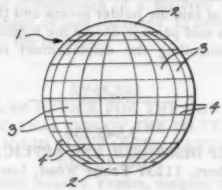
FORMATION OF SEGMENTS FOR CONTAINERS AND THE LIKE

Harry Hooper, Brookfield, Wis., assignor to C-R-O Engineering Co., Inc., Brookfield, Wis.

Filed Oct. 3, 1974, Ser. No. 511,502

Int. Cl.² B21D *28/00*

U.S. Cl. 72—340 **3 Claims**



1. The method of forming a compound curved plate-like segment for edge attachment to a like segment for use in manufacturing a large body of substantially spherical contour, said method comprising the steps of:

a. forming a plate into a segment having top and bottom surfaces of compound curvature and having a plurality of angular peripheral edges,

b. placing said plate in a generally horizontal position,

c. cutting said peripheral edges as if from infinity to form edge faces, the planes of which are vertical and mutually parallel and which form fixed references relative to said surfaces,

d. and subsequently contour-cutting along said formed edge faces with a cutting tool while following said edge faces in a manner to guide the tool and control its depth of cut, and while simultaneously following at least one of said surfaces in a manner to maintain the tool axis substantially perpendicular to the said followed surface adjacent the point of tool contact with the edge face.

3,945,237

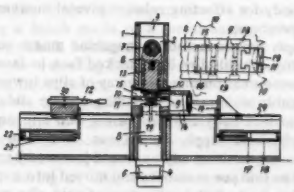
HIGH SPEED HAMMER FORGING MACHINES

Silvio Brignoli, Kanton Tessin, CH-6981 Monteggio, Switzerland

Filed Dec. 23, 1974, Ser. No. 535,829

Int. Cl.² B21J *7/32*

U.S. Cl. 72—402 **15 Claims**



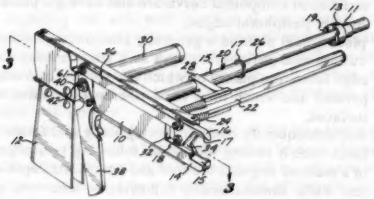
1. A high-speed precision hammer machine for forging a workpiece, comprising a housing forming an inner chamber; at least four hammers arranged in opposed pairs in said cham-

ber and distributed radially around a passage along which the workpiece advances through said chamber; die holder means guiding said hammers for radial movement toward and away from a workpiece in said passage; means for connecting each hammer with an associated die holder means; dies held by the respective die holder means; a plurality of eccentric hammer drive shafts arranged in said chamber and extending transverse of said passage radially spaced therefrom, said shafts being arranged in two pairs, the shafts of each pair extending parallel to one another and at right angles to the shafts of the other pair; drive means for said shafts, including a plurality of motors each in axial alignment with one of said shafts; means for providing positive rotational connection of said shafts with one another; means for effecting simultaneous radially inward movement of the hammers of each pair in alternation with similar movement of the hammers of the other pair; forging stroke adjusting means displaceable longitudinally of said passage and interposed between each hammer and the associated die holder means thereof for effecting simultaneous radial shifting of said die holder means and their dies towards and away from said passage during the forging operation; and means for controlling the displacement of said adjusting means.

3,945,238
CLIP DISPENSER AND APPLICATOR

Robert L. Eckert, 11231 Foster Road, Los Alamitos, Calif. 90720

Filed Oct. 24, 1974, Ser. No. 517,516
Int. Cl.² B21D *9/08*
U.S. Cl. 72—410 **7 Claims**



1. A tool for applying clips such as hog rings and the like about a work element comprising:

a tool body;

first and second jaw members in fixed pivotal connection on said tool body to receive and crimp said clips about said work element;

lever means mechanically linked thereto and carried on said tool body for effecting relative pivotal movement of said jaw members;

clip supply means including magazine means supporting a plurality of said clips in a stacked face-to-face array and resilient means biasing said array of clips toward said tool;

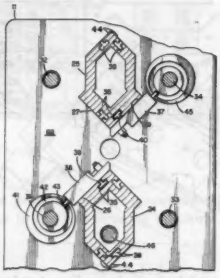
reciprocable slide means including a plate slidably carried on said tool body and supporting said clip supply means whereby said supply means can be moved into a clip dispensing position adjacent said jaw members to deliver a clip to said jaw members and moved into a spaced apart position to permit application of said clip to said work element; and

clip retaining groove means extending along opposite portions of said jaw members to receive a clip from said supply means.

3,945,239
METAL FORMING MACHINE WITH MULTIPLE EXTENDED BEDS

Frank S. Russell, Holden, Mass., assignor to Sleeper & Hartley Corporation, Worcester, Mass.

Filed June 6, 1975, Ser. No. 584,398
Int. Cl.² B21J *13/02*
U.S. Cl. 72—452 **12 Claims**



1. A metal forming machine for forming metal components from wire or metal strip by passing a length of wire or metal strip between reciprocally operated forming slides comprising:

a. a machine frame;

b. a first bed support extended along a first axis mounted within said frame, said first bed support carrying two bed surfaces having planes lying perpendicular to each other;

c. a second bed support extended along a second axis parallel to said first axis mounted within said frame, said second bed support carrying two bed surfaces having planes lying perpendicular to each other and the bed surface planes of said second bed support being parallel to respective bed surface planes of said first bed support;

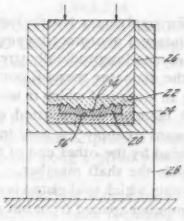
d. means integral with said first and second bed supports to support a plurality of tool carriers from each of said bed surfaces; and,

e. means to provide reciprocating motion to tools in tool carriers supported from said bed surfaces.

3,945,240
DIFFUSION BONDING SEPARATOR

Bruce T. Brown, Riviera Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 16, 1972, Ser. No. 298,043
Int. Cl.² B21D *37/01*; **B21J** *13/00*
U.S. Cl. 72—462 **4 Claims**



1. Metal deformation apparatus which comprises:

at least one movable, pressure-exerting member; and

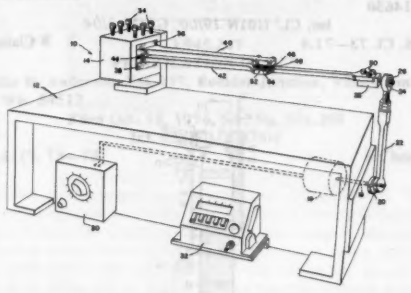
a pressure-exerting surface on said member for contact with a solid metal article being processed, said surface consisting essentially of solid boron nitride of substantially full density.

3,945,241

FRETTING CORROSION TEST FIXTURE

Stanley R. Brown, Doylestown, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 18, 1975, Ser. No. 559,604
Int. Cl.² G01N 3/56
U.S. Cl. 73—7 10 Claims



1. A test fixture for fretting corrosion testing of first and second material specimens, comprising in combination:

clamping means;

a flexure bar fixed at one end in said clamping means and formed to secure the first specimen intermediate the ends thereof;

a load bar fixed at one end in said clamping means parallel to said flexure bar and formed to secure the second specimen near the other end thereof and in abutment with the first specimen; and

force exerting means connected to the other end of said flexure bar for producing a reciprocating force thereon in the plane formed by the respective longitudinal axes of said flexure and said load bars, said force exerting means including an adjustable means for maintaining a compressive load applied at the specimen interface surface during the application of said reciprocating force.

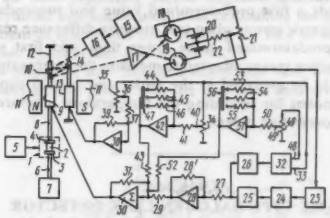
3,945,242

METHOD OF MEASURING DYNAMIC CHARACTERISTICS OF MATERIALS AND DEVICE FOR EFFECTING SAME

Lev Petrovich Ulyanov, Eropkinsky pereulok, 7, kv. 6; Oleg Nikolaevich Borisenkov, ulitsa Oktyabrskaya 24, kv. 8; Natalya Nikolaevna Kastorskaya, ulitsa Bolshaya Cherkizovskaya 5, korpus 1, kv. 69; Georgy Vladimirovich Vinogradov, ulitsa Chernyshevskogo, 41, kv. 26; Jury Grigorievich Yanovsky, ulitsa Bolshaya Serpukhovskaya, 48, kv. 11, and Sergei Ivanovich Sergeenkov, ulitsa Dmitria Ulyanova, 3, kv. 123-a, all of Moscow, U.S.S.R.

Filed Aug. 13, 1973, Ser. No. 387,814
Int. Cl.² G01N 3/32
U.S. Cl. 73—15.4 4 Claims

4. A method of measuring dynamic characteristics of materials in the infralow frequency range, comprising the steps of ensuring oscillations of a specimen of a material at a preset amplitude and frequency by obtaining, in the course of measurement, a control current and converting said control current into a mechanical stress of said specimen of a real and an imaginary component of said control current, discriminating a first time and analyzing said components of said control current, generating two restoring currents, one being in phase and commensurable with said real component of said control current, whereas the other is in phase and commensurable with said imaginary component of said control current, summing said control current and said two restoring currents, converting the total current into a mechanical stress of the specimen for controlling the movement of said specimen for a preset amplitude and frequency, discriminating for a second time the real and imaginary components of said control current, said values of the components of said control current, the



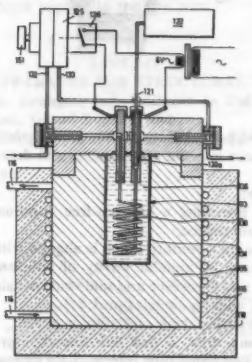
values of said restoring currents and the preset amplitude and frequency of the deformation of a material being used, in relation to the shape of said specimen, to calculate dynamic characteristics of the material.

3,945,243

METHOD AND DEVICE FOR THE CONTINUOUS AUTOMATIC ANALYSIS OF THE FILTERABILITY POINT OF LIQUID SUBSTANCES, PARTICULARLY DIESEL OIL

Paul Ouvrard, Saint-Nazaire, France, assignor to Societe Anonyme dite: Antar Petroles de l'Atlantique, Paris, France

Filed Sept. 13, 1974, Ser. No. 505,645
Claims priority, application France, Sept. 19, 1973, 73.33670
Int. Cl.² G01N 25/02
U.S. Cl. 73—17 R 4 Claims



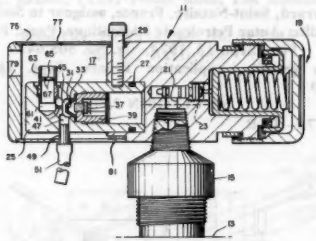
1. An apparatus for the continuous automatic measure of the filterability threshold temperature of a liquid substance comprising a block made of a metal having a high thermal inertia, said block having an external surface and a closed recess therein, a cooling liquid substantially filling said recess, said cooling liquid having a freezing temperature substantially lower than the average filterability threshold temperature of the type of liquid to be analyzed, cooling means on said external surface of said block adapted to cool said block, an electrically conductive metal capillary tube immersed in said cooling liquid and having an inlet end and an outlet end emerging from said block, said tube being electrically insulated from said block, pump means for delivering the liquid to be analyzed to said tube at a constant volume flow rate, electrical connecting means to connect both ends of said tube with the terminals of an electric power supply respectively, switch

means interposed on one of said electrical connecting means, pressure responsive meeans in connection with said switch means whereby said electric power is supplied to said electrically conductive metal capillary tube when the difference between the inlet pressure and outlet pressure of said capillary tube exceeds a first predetermined value and suspends said supply of electric power when said pressure difference reaches a second predetermined value lower than said first value, thermosensitive means adapted to measure the temperature of the liquid to be analyzed in the outlet end of said capillary tube and means for recording the temperature measured by said thermosensitive means.

3,945,244
FLAME TYPE HALOGEN LEAK DETECTOR

Alex F. Wormser, Marblehead, and Stephen P. Perkins, Beverly, both of Mass., assignors to Wingaersheek, Inc., Peabody, Mass.

Filed Oct. 11, 1974, Ser. No. 514,113
Int. Cl.² G01M *3/04*; G01N *31/12*
U.S. Cl. 73—40.7 **4 Claims**



1. A flame-type leak detector for locating leaks of fluorine containing gases into the atmosphere, said detector comprising:

a jet orifice;

means for providing a halogen-free combustible gaseous fuel to said orifice;

means defining a venturi which is aligned with said orifice, there being an annular cavity of substantial diameter between said jet orifice and said venturi, said cavity being provided with an air inlet port;

a flame tube into which said venturi opens;

in said flame tube, a disk-like flameholder substantially bridging said flame tube intermediate its ends, said flameholder being constructed of copper and being shaped to occlude said flame tube except for a series of circumferentially located notches opening a minor portion of the area of said tube, said notches being inclined to impart a swirling movement to gases passing said flameholder, the central portion of said flameholder generating a downstream zone of recirculating burned gases which provides continuous re-ignition of incoming fuel-air mixture and which heats said flameholder itself, said flame tube and said flame-holder being relatively proportioned to cause said flameholder to operate in thermal equilibrium at a temperature of about 600°–900°F; and

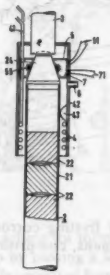
a flexible inlet tube coupled to said sample inlet port,

whereby the color of a flame generated in said flame tube is highly sensitive to the presence of halogen compounds in the air immediately adjacent the distal end of said inlet tube.

3,945,245
METHOD AND EQUIPMENT FOR DETECTING DEFLECTIVE NUCLEAR FUEL RODS

Heinz Stehle, Marloffstein; Helmut Assmann, Erlangen; Peter Wahode, Nurnberg, and Walter Janson, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 18, 1974, Ser. No. 452,254
Claims priority, application Germany, Mar. 23, 1973, 2314650
Int. Cl.² G01N *29/00*; G01M *3/04*
U.S. Cl. 73—71.4 **8 Claims**

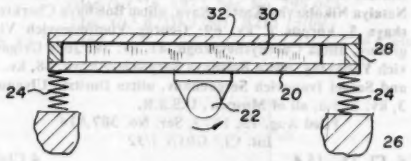


1. A method for detecting defective fuel rods while in a fuel assembly removed from a water-cooled reactor and under water, said assembly containing a bundle of closely interspaced fuel rods having end portions with end caps accessible under the water; said method comprising heating said end portions via their outsides to apply heat to their insides, and via the outsides of said end caps detecting possible water inside of said fuel rods by measuring a power transmitted through said end caps and which is responsive to the action of said heat on the contents of said insides.

3,945,246
VIBRATING TABLE WITH DUAL PLATE TOP

Theodore S. Wadensten, P.O. Box 8, Stilson Road, Wyoming, R.I. 02898

Filed Oct. 24, 1974, Ser. No. 517,597
Int. Cl.² B06B *1/00*
U.S. Cl. 73—71.6 **9 Claims**



1. A vibrating table having a dual top and whose top surface is absent dead spots as it is vertically oscillated by at least one rotary motion vibrator, and as thus vibrated the entire top surface vibrates with substantially the same amount of vertical oscillation, said table as constructed including: (a) a support base; (b) a multiplicity of vibration isolators, each secured at one end to and carried by the support base; (c) a lower frame carried by the vibration isolators so as to be at least partially independently movable with respect to the support base; (d) rigid transfer pads carried by and secured to at least two edge portions of the lower frame and spaced from each other to define and provide a support plane a fixed short distance above the lower frame; (e) an upper table top member secured to and carried by the rigid transfer pads and at only said

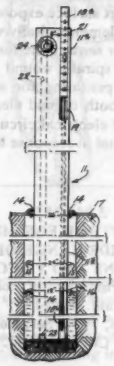
edge portions so that said upper top member is spaced a determined distance above the lower frame, all areas of the entire upper table top member being moved vertically in accordance with the amplitude and frequency of vibrations of the lower frame which are present at those edge areas of fixed attachment of the transfer pads to the lower frame, and (f) at least one rotary motion vibrator secured to the lower frame and when actuated adapted to impart vertical oscillations at a selected frequency and amplitude to the lower frame to which it is attached.

3,945,247

PERCOLATION GAUGE

John D. Anderson, Box 157, Boulder Junction, Vilas County, Wis. 54512

Filed Oct. 18, 1974, Ser. No. 516,200
Int. Cl.² E21B *47/04*
U.S. Cl. 73—73 **8 Claims**



1. A method of performing ground percolation tests comprising the steps of making a percolation test opening in the ground, inserting an at least partially hollow housing having a calibrated depth gauging member mounted for translation therein into the percolation test opening, filling the percolation test opening with water through the at least partially hollow housing to a predetermined level, causing the depth gauging member to be continuously translated with respect to the housing corresponding to the continuous change in water level in the percolation test opening as water is absorbed in the ground, whereby the amount said depth gauging member is thus translated during a predetermined time serves as an indication of the percolation characteristics of the ground.

3,945,248

WIRE BOND INTEGRITY TESTER

Harry E. West, 6620 E. Koralee Way, Tucson, Ariz. 85710

Filed June 9, 1975, Ser. No. 584,960
Int. Cl.² G01N *3/14*
U.S. Cl. 73—88 B **9 Claims**

1. A wire bond integrity tester connected to a source of low pressure for testing the bond which attaches a fine wire to a microelectronic module, said tester comprising in combination:

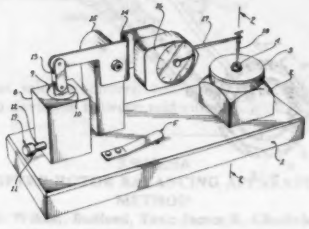
a. a base, said base including a manifold in fluid communication with the source of low pressure;

b. a platform mounted upon said base for supporting the module, said base including a chamber in fluid communication with said module for applying low pressure to the lower surface of the module, whereby, the pressure difference between the low pressure and ambient pressure retains the module in place;

c. a pedestal mounted upon said base for housing a piston within a cylinder, said piston being axially movable in response to change in air pressure within said cylinder;

d. air flow regulating means disposed intermediate said cylinder and said manifold for controlling the axial movement of said piston by regulating the flow of air between said cylinder and said manifold;

e. a pivotable arm mounted above said base for interconnecting said piston with the fine wire, said arm applying



a force to the fine wire in proportion to the axial movement of said piston, said arm having gauge means for recording the force applied to the fine wire; and

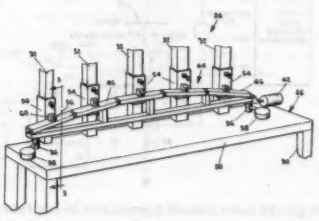
f. a normally open vent valve for venting said manifold to ambient air pressure and relieving the force applied to the module and the fine wire; whereby, on closure of said valve a force is applied to retain the module in place and a regulated and recorded test force is applied to the fire wire while maintaining the capability of instantly and simultaneously relieving the module retaining force and the test force applied to the fine wire.

3,945,249

TESTING APPARATUS FOR STRUCTURAL MEMBERS

Wayne Knoth, Granger, Ind., assignor to Universal Forest Products, Inc., Grand Rapids, Mich.

Filed July 1, 1974, Ser. No. 484,854
Int. Cl.² G01N *3/08*
U.S. Cl. 73—94 **15 Claims**



8. Testing apparatus for measuring the load bearing capabilities of rafter structure for supporting a roof comprising:

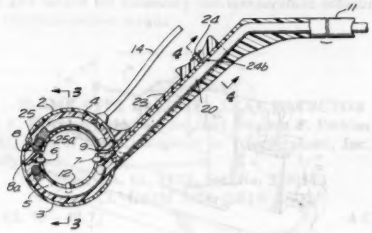
load cell means mounted in a fixed position and adapted to support the bottom of the rafter at predetermined points thereon and measure the load on the rafter at each such point; and

fluid pressure applying means for applying a uniform downward pressure along the entire length of the top of the rafter.

3,945,250
FLOW TRANSDUCERS

Shmuel Elazar, Camarillo, and Charles A. Bierbaum, Port Hueneme, both of Calif., assignors to Statham Instruments, Inc., Oxnard, Calif.

Filed Apr. 19, 1974, Ser. No. 462,345
Int. Cl.² G01F 1/58
U.S. Cl. 73—194 EM 8 Claims

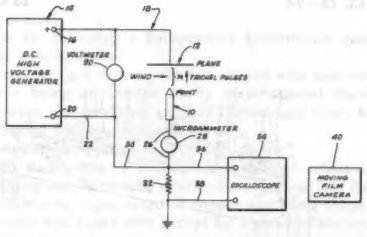


1. A blood flow transducer comprising a lumen section, said lumen section being split into a pair of arcuate lumen parts, an arcuate electromagnetic coil mounted in said lumen section, a pair of electrodes mounted in said lumen section, and mounting means for said lumen parts to enable selective rectilinear relative displacement therebetween, whereby said parts may be separated to provide a gap between adjacent edges thereof and moved towards each other to close said gap.

3,945,251
TRICHEL PULSE CORONA GAS VELOCITY INSTRUMENT

Edward T. Pierce, Menlo Park, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed Oct. 11, 1974, Ser. No. 514,111
Int. Cl.² G01F 1/56
U.S. Cl. 73—194 F 2 Claims

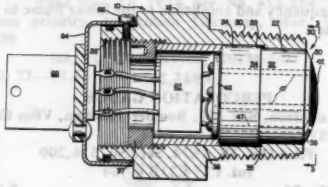


1. The method of determining variations is the velocity of a gas, which method includes applying an uninterrupted unidirectional negative potential to a point electrode, thereby generating a continuing series of ionization pulse discharges; subjecting the said pulse discharges to the flow of gas, thus determining the frequency of repetition of the said pulse discharges in accordance with the velocity of said gas and variations in the frequency of the said pulse discharges in accordance with variations in the velocity of the said gas; and determining the variations in the pulse repetition frequency rate, thereby to determine variations in the velocity of the gas.

3,945,252
FLUID FLOW MEASURING APPARATUS

William Victor Fiore, 28 Seaview Harbor, Longport, N.J. 08403

Filed Jan. 30, 1975, Ser. No. 545,566
Int. Cl.² G01F 1/68
U.S. Cl. 73—204 8 Claims

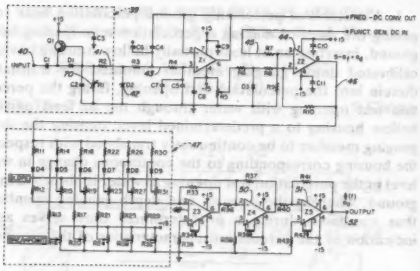


1. Flow sensing apparatus comprising support means adapted to be mounted on a fluid conduit and having a convex spherically shaped support surface exposed to the fluid in said conduit, a first resistive element spirally wound on the central section of said surface for sensing the flow rate of the fluid, a second resistive element spirally wound on the outer section of said surface for compensating for ambient temperature conditions of the fluid, both of said elements being directly exposed to the fluid, and electrical circuit means for producing an output control signal in response to the resistive condition of said elements.

3,945,253
APPARATUS AND METHOD FOR MEASURING FLUID FLOW OVER A WIDE RANGE OF FLUID FLOW CONDITIONS AND VISCOSITIES

Frederick F. Liu, and Arnold E. Liu, both of 17812 Community St., Northridge, Calif. 91324

Filed Mar. 28, 1974, Ser. No. 455,517
Int. Cl.² G01F 1/12
U.S. Cl. 73—231 R 34 Claims



1. An apparatus for obtaining a measure of fluid flow rate over the laminar, transitional and turbulent flow range comprising:

a turbine flowmeter located in a fluid flow line and producing a frequency output signal variable with flow rate;

means for comparing said output signal with a constant reference value to produce a difference signal which is zero throughout the turbulent flow range of the fluid through the flowmeter commencing at frequency (f_1);

means responsive to said difference signal for producing a compensating signal for compensating said output signal of said flow meter over the laminar and transitional flow ranges for variations from quantities indicated by the straight line function of flow rate versus frequency in the turbulent flow range; and

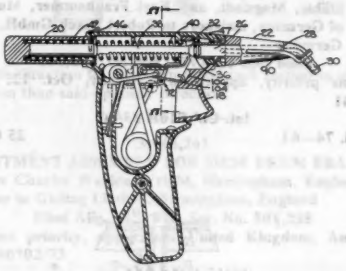
means for combining said compensating signal with said flowmeter output signal to obtain a correct value of flow rate in the laminar and transitional flow ranges.

3,945,254

MULTIPLE SHOT PIPETTER

Jerome I. Rebold, Baltimore, Md., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Dec. 16, 1974, Ser. No. 532,877
Int. Cl.² G01N 1/14
U.S. Cl. 73—425.6 **1 Claim**



1. A device for aspirating a supply of liquid into a pipette and dispensing the same in precise predetermined dosages, said device comprising: a housing; a cylindrical passage within said housing, said passage having an open front end and an open rear end; a piston extending into said passage from said rear end; a plunger extending rearwardly from said piston; means on said housing for securing a pipette to said housing in communication with said passage front end; first spring means within said housing biased to urge said piston toward said rear end; a trigger extending from said housing; actuating means disposed within said housing for advancing said plunger forward a discrete amount each time said trigger is pressed and released; an outlet nozzle attached to said housing; an opening through said nozzle in communication with said housing front end; means on said nozzle for securing a pipette in position about said nozzle; and means on said housing for urging said pipette off said nozzle securing means, said pipette urging means comprising a member eccentrically mounted about said nozzle, said member having a portion disposed about said pipette securing means whereby rotation of said member causes said portion to move forwardly to urge said pipette off said nozzle securing means.

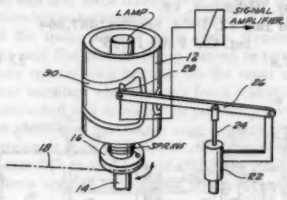
3,945,255

METHOD OF AND APPARATUS FOR MONITORING A PROCESS INVOLVING A PLURALITY OF PARAMETERS

Hans Flinker Bisgaard, Hasselager, and Benny Aaris Klemar, Soeften, both of Denmark, assignors to H. Maihak AG, Hamburg, Germany

Filed Mar. 4, 1974, Ser. No. 447,714
Int. Cl.² G08B 23/00
U.S. Cl. 73—432 R **10 Claims**

1. A method of monitoring a process which involves a plurality of parameters, comprising the steps of monitoring at least two of the parameters of said process which are desired to have a prescribed relationship to each other; forming a curve which graphically represents the actual relationship of said parameters to each other; comparing the thus obtained curve to a standard curve which represents the desired relationship of said parameters; and producing a signal in the event of a deviation between said curves.

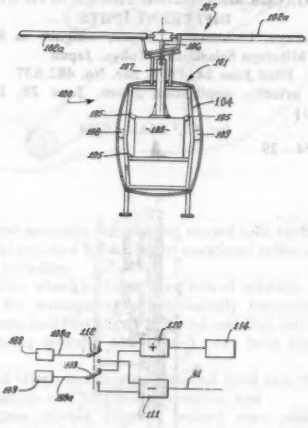


3,945,256

HELICOPTER ROTOR BALANCING APPARATUS AND METHOD

William F. Wilson, Bedford, Tex.; James R. Chadwick, Bradbury, and James G. Helmuth, Monrovia, both of Calif., assignors to Chadwick-Helmuth Company, Inc., Monrovia, Calif.

Filed Apr. 21, 1975, Ser. No. 570,225
Int. Cl.² G01M 1/22, 1/28
U.S. Cl. 73—455 **12 Claims**



1. In the method of balancing a bladed rotor having multiple blades and defining an axis of rotation, and wherein structure proximate the rotor is subject to vibratory motion due to a dynamic unbalance condition of the rotating rotor and an out-of-track condition of the rotor blades, the method employing two vibration pickups, the method including

a. operating the pickups to produce vibratory signals corresponding to up and down vibratory motion of the structure at port and starboard sides of said axis,

b. combining said signals to produce a resultant oscillatory output signal characteristic of rotor vibratory motion due substantially to only one of said conditions,

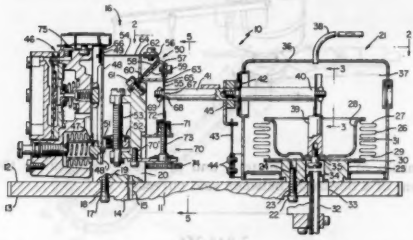
c. using said resultant output signal to alleviate said one condition.

3,945,257

FORCE BALANCE TRANSMITTER AND METHOD OF MAKING THE SAME

Jacob R. Rosenfeld, Roslyn, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed July 12, 1974, Ser. No. 487,864
Int. Cl.[2] F16J 15/50
U.S. Cl. 74—17.8 22 Claims



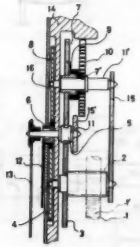
2. A force balance transmitter as set forth in claim 2 and including a pair of flexure arms disposed at substantially a right angle relative to each other and respectively being interconnected to said primary arm and said secondary arm, said bell crank flexure pivot means interconnecting said flexure arms together.

3,945,258

DIAL GAUGE MEASURING THE LENGTH IN TWO DIFFERENT UNITS

Tadao Nakaya, Utsunomiya, Japan, assignor to Kabushiki Kaisha Mitutoyo Seisakusho, Tokyo, Japan

Filed June 24, 1974, Ser. No. 482,637
Claims priority, application Japan, June 28, 1973, 48-076987[U]
Int. Cl.[2] F16H 19/04
U.S. Cl. 74—29 4 Claims



1. Dial guage for measuring length in units belonging to two different systems of measurement, said gauge comprising:

a frame,

a first shaft rotatably mounted in said frame and carrying a pinion fixed thereto,

a spindle mounted in said frame for longitudinal movement in dependence on the length to be measured and carrying a rack which meshes with said pinion,

first and second gears fixed to said first shaft to rotate with said pinion,

a second shaft mounted in said frame and carrying a first pointer,

a center pinion fixed to said second shaft and meshing with said first gear,

a drive pinion rotatably mounted on said second shaft, carrying a second pointer, and meshing with said second gear,

a dial carrying scales calibrated in units of said two different systems, with each scale cooperating with one of said pointers, and the gear ratios between the gears on said first shaft and the pinions on said second shaft bearing the same proportional relationship as the units of said two different systems, and

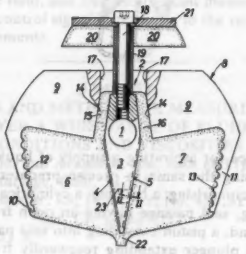
backlash eliminating means connected to resiliently resist rotation of one of said gears relative to said frame and rotation of the other of said gears relative to said one gear.

3,945,259

VIBRATION GENERATOR

Eugen Stähle, Magstadt, and Karl Frauhammer, Musberg, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 15, 1974, Ser. No. 515,005
Claims priority, application Germany, Oct. 12, 1973, 2351241
Int. Cl.[2] F16H 33/00
U.S. Cl. 74—61 25 Claims



1. Vibration generator, particularly for vibratory cconveyors and screens, comprising a shaft having an axis; means for rotating said shaft about said axis at variable angular speeds within a lower and a higher range of speeds and including a motor; a first element fixedly mounted on said shaft for rotation therewith and imbalanced with respect to said axis; a second element also imbalanced with respect to said axis and displaceable substantially radially outwardly from said shaft and proximally to said first element under the influence of centrifugal forces to a series of positions in each of which said generator produces vibrations of a different magnitude; and elastomeric means for connecting said elements with one another and for yieldably restraining said second element against displacement to said positions while the angular speed of said shaft is within said lower range.

3,945,260

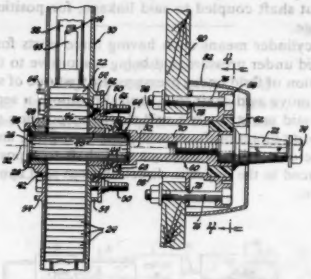
ACTUATOR ASSEMBLY

Louis T. Horvath, Solon, and Clifford H. Allen, Chesterland, both of Ohio, assignors to Teleflex Incorporated, North Wales, Pa.

Filed Aug. 13, 1973, Ser. No. 387,937
Int. Cl. F16h 19/04
U.S. Cl. 74—89.17 13 Claims

1. An improved actuator assembly comprising; a rack, a pinion engaging said rack for moving said rack, a rack and pinion housing supporting said pinion for rotation about an axis and supporting said rack for movement tangentially of

said pinion, said housing (surrounding and) extending along said rack from said axis farther in one direction than in the opposite direction for supporting said rack farther in said one direction than said opposite direction.



3,945,261

ABUTMENT ASSEMBLY FOR SHOE DRUM BRAKES

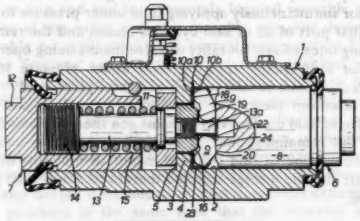
Andrew Charles Walden Wright, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed Aug. 29, 1974, Ser. No. 501,295

Claims priority, application United Kingdom, Aug. 29, 1973, 40702/73

Int. Cl.[2] F16H *21/44*

U.S. Cl. 74—110 2 Claims



1. An abutment assembly for a shoe drum brake comprising a fixed housing having a through bore, first and second abutment members slidably received in said bore and having opposed inner ends and exposed outer ends for engagement with adjacent ends of respective brake shoes, a fixed annular shoulder in said bore between the inner ends of said abutment members, an axially extending output member carried by said second abutment member and having an annular shoulder coaxial with but of smaller diameter than said fixed annular shoulder, both of said shoulders facing in axially spaced relationship the inner end of said first abutment member, an axially extending cylindrical spindle on said output member extending from the shoulder thereof towards the inner end of said first member, and a plurality of radially extending force transmitting members arranged symmetrically around the axes of said abutment members and having flat side faces normal to said shoulders and having curved surfaces on their inner and outer ends, an annular cage engaging said fixed shoulder and said bore and pivotally receiving the outer ends of said force transmitting members, the inner ends of said members engaging the cylindrical surface of said spindle, each of said members also having on its inner side a pair of radially spaced curved parts respectively engaging the part of said cage which engages said fixed shoulder in said bore and the movable shoulder on said output member and having on its outer side a surface of which the radially inner portion is flat and normally in engagement with the inner end of said first abutment member so that said force transmitting means is prevented by said flat portion from pivoting whereby a force applied to said second abutment member is transmitted through said output member and said force transmitting member to said first abutment member substantially unchanged, a radially outer portion of the outer side of each force transmitting member adjacent said flat portion being curved to permit pivoting of said force transmitting member on the inner end of said first abutment member whereby said force transmitting members are constructed and arranged to provide a lever ratio as they fulcrum about that part of the cage engaging said fixed shoulder to transmit from said first abutment member through said output member to said second abutment member only a part of the force applied to said first abutment member.

3,945,262

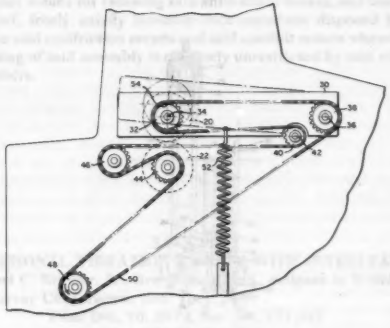
DRIVE FOR FEED ROLLS

Charles De Witt Griffin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 29, 1974, Ser. No. 518,870

Int. Cl.[2] F16H *7/00, 7/12*

U.S. Cl. 74—219 3 Claims



1. A drive assembly for first and second rolls each having a drive wheel attached for driving its associated roller, said drive assembly including:

a first idler wheel having a fixed axis of rotation,

means for maintaining a substantially constant spacing between said first idler wheel and said first roll, said first roll being movable toward and away from said second roll,

a second idler wheel having a second fixed axis of rotation contiguous said first axis of rotation, and

an endless driving element trained over said wheels, whereby the driving element length between said first roll and each of said first and second idler wheels remains substantially constant.

3,945,263

CONNECTION FOR THE ENDS OF STRENGTH CARRIERS IN CONVEYOR BELTS

Harald Simonsen, Ludersen, and Jürgen Bräutigam, Hannover, both of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

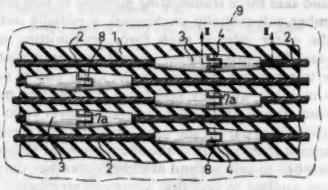
Filed Sept. 6, 1974, Ser. No. 503,708

Int. Cl.[2] G01F *1/06, 3/34*

U.S. Cl. 74—231 J 14 Claims

1. An endless conveyor belt having metal cable connection, which includes in combination: strength carrier means embedded in said conveyor belt and having two ends arranged in spaced alignment to and facing each other, and first and sec-

ond sleeve means respectively yieldably holding said aligned ends therein, said first and second sleeve means with said



aligned ends held completely surrounded therein being connected to each other.

3,945,264

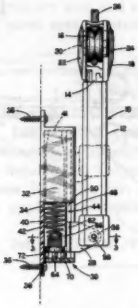
REACTION SUPPORT FOR PULLEY HOLDDOWN

Douglass R. Falkenberg, Rocky River, Ohio, assignor to Douglass Manufacturing Company, Inc., Elyria, Ohio

Filed June 3, 1974, Ser. No. 475,390

Int. Cl.² F16H *7/12, 7/10;* **F16F** *1/00, 9/00*

U.S. Cl. 74—242.1 A **9 Claims**



1. In combinatin with a pulley holddown for retaining the operating cord of a traverse rod which carries drapery material adjacent a window or wall opening, the pulley holddown retaining the operating cord in tension and proper operative position:

a. A separate reaction support adapted to be attached to a wall or floor surface and cooperating with the pulley holddown to provide a resilient reaction means between the pulley holddown and the wall or floor surface; and,

b. the reaction support comprising an elongated member having a sliding coacting engagement with the pulley holddown and a resilient member resisting such sliding engagement to provide a reaction means to outward pull of the traverse rod cord and upward movement of the pulley holddown.

3,945,265

FLUID ACTUATED GEAR CHANGING SYSTEM

Charles Gilbert Bell, 2220 S. Helen, Sioux City, Iowa 51106, and Michael M. Randolph, 2814 Nebraska St., Sioux City, Iowa 51104

Filed Nov. 8, 1974, Ser. No. 522,214

Int. Cl.² B60K *20/16;* **F16H** *3/08;* **B60K** *41/22*

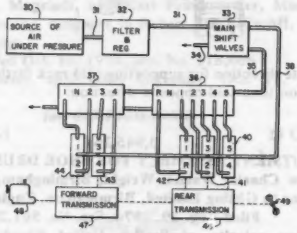
U.S. Cl. 74—335 **9 Claims**

1. A system for changing the gear ratio of a transmission of a type having a plurality of gears which are movable into and out of positions of meshing engagement with other gears to establish a neutral or drive train condition in the transmission, a clutch, movable fork means for repositioning the movable gears, and a linkage for supporting and moving the fork means, the system comprising the combination of

a source of fluid under pressure;

a plurality of fluid operated cylinder means, each having an output shaft coupled to said linkage, for positioning the linkage,

said cylinder means each having three ports for passing fluid under pressure and being responsive to the application of fluid under pressure at a first one of said ports to move said shaft to a central position, a second one of said ports to move said shaft to a position displaced in one direction from said central position, and a third one of said ports to move said shaft to a position displaced in the opposite direction from said central position;



a control valve unit having a plurality of valve means for selectively directing fluid under pressure from said source to ports of said cylinder means,

said plurality of valve means including a first valve means for simultaneously applying fluid under pressure to said first port of all of said cylinder means and the remaining ones of said plurality of valve means being operable for individually applying fluid under pressure to selected ones of said second and third ports; and

shift selection means for sequentially actuating said first valve of said control valve means and then a selected one of the remaining ones of said valve means to cause a selected one of said cylinder means to move its output shaft and the linkage coupled thereto to a new shift position.

3,945,266

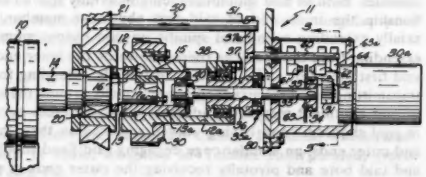
CIRCUMFERENTIAL REGISTER ASSEMBLY

Charles H. Dufour, Westerly, R.I., and Robert D. Hercock, Fort Worth, Tex., assignors to Harris Corporation, Cleveland, Ohio

Filed Nov. 6, 1974, Ser. No. 521,283

Int. Cl.² F16H *35/08;* **B41F** *13/24*

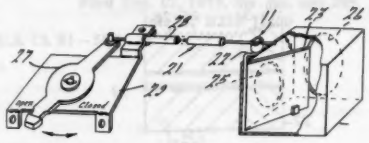
U.S. Cl. 74—401 **9 Claims**



1. Apparatus comprising a printing cylinder, a first member and a second member, means supporting said first and second members coaxially of the printing cylinder, means fixing a first one of said members to said cylinder to rotate said cylinder and to move axially with said cylinder, means for moving said second member axially relative to said first member, said first and second members having cooperating engaging parts which

effect a camming action therebetween upon relative axial movement and rotation of said member and said cylinder, and means for moving said cylinder and both of said members simultaneously axially.

3,945,267
ADJUSTABLE CONNECTOR
Donald E. Stimpson, Madison Heights, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed Feb. 26, 1969, Ser. No. 802,423
Int. Cl.[2] F16C 1/10
U.S. Cl. 74—501 R 6 Claims



6. In a control system having movable control means in the form of a flexible cable comprising a wire and wire sheath, the wire being operatively connected to a movable actuator device at one end and to a remotely located movable actuable device at the other end, the movable actuator device being movable by application of a normal manipulation force between first and second extreme selection positions, and the movable actuable device being movable between first and second extreme operating positions in response to movement of the actuator device, the invention of adjustment means to locate and correlate the extreme selection positions of the movable actuator device relative to the extreme operating positions of the movable actuable device so that the movable actuator device is located in at least one of the extreme selection positions at the same time that the movable actuable device is located in one of the extreme operating positions and comprising:

first connection means connecting said wire to said movable actuable device whereby manipulative movement of said wire causes responding manipulative movement of said movable actuable device,

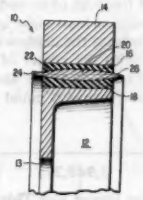
second connection means connecting said wire to said movable actuator device whereby manipulative movement of said movable actuator device causes responding movement of said wire,

and at least one of the connection means comprising a separate one-piece adjustment clip means having self-releasing resilient spring-like gripping jaw means adjustably connecting the wire to one of the devices and permitting sliding positional adjustment between the wire and the one of the devices by self-release upon application of a predetermined adjustment force in excess of the normal manipulation force when the positions of the devices are not properly correlated thereby to adjust the relative positions of the devices and thereafter permanently holding the wire and the one of the devices in the adjusted position during subsequent applications of normal manipulation forces, said self-releasing resilient spring-like gripping jaw means being formed on the edges of opposite spaced side walls of said clip means and defining an open wire receiving channel permitting the wire to be associated with said jaw means of the clip means by movement transverse to the actuating movement of the wire.

3,945,268
MOTION TRANSMITTING REMOTE CONTROL ASSEMBLY
John C. Ion, Doylestown, and George M. Zieber, Jr., King of Prussia, both of Pa., assignors to Teleflex Incorporated, North Wales, Pa.
Filed Sept. 19, 1974, Ser. No. 507,390
Int. Cl.[2] F16C 1/10, 1/02
U.S. Cl. 74—501 R 21 Claims

1. A motion transmitting remote control assembly comprising: flexible conduit means, tubular end members at each end of said conduit means, load bearing means surrounding a portion of said conduit means and attached to said end members, a motion transmitting core element supported for axial movement within said conduit means, antifriction means for engaging said core element for facilitating movement thereof, retainer means for retaining said antifriction means, and unanchored, freely axially movable race members disposed between said antifriction means and said conduit means whereby bending of said assembly is relatively unrestricted by said race members.

3,945,269
TORSIONAL VIBRATION DAMPER WITH INTERLEAF
Robert C. Bremer, Jr., Brownsburg, Ind., assignor to Wallace Murray Corporation, New York, N.Y.
Filed Dec. 10, 1974, Ser. No. 531,349
Int. Cl.[2] F16F 15/12
U.S. Cl. 74—574 16 Claims

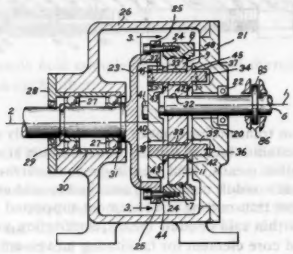


1. A torsional vibration damper of the type defined by a hub adapted to be rotatably coupled to the crankshaft of an internal combustion engine, the hub carrying on its outer periphery an inertia member coupled to it by elastomer, an annular interleaf within the elastomer to divide it into two annular elements which sandwich the interleaf, the outer radial surface of the hub and the inner radial surface of the inertia member each define a cylinder, the improvement comprising, the interleaf being of non-uniform cross-section to thereby radially deform the elastomer different amounts at different axial positions therealong.

3,945,270
FRICTION DRIVE TRANSMISSION

Bertel S. Nelson, Naperville, and Woodrow D. Nelson, Lockport, both of Ill., assignors to Wedgtrac Corporation, Yorkville, Ill.

Filed Feb. 18, 1975, Ser. No. 550,545
Int. Cl.² F16H 13/14
U.S. Cl. 74—798 18 Claims



1. A rotary motion transmission device, operable in either direction of rotation with a fixed transmission ratio, comprising input and output shafts having spaced parallel axes of rotation, a ring roller having a cylindrical internal traction surface carried by one of said shafts, an inner roller having a cylindrical external traction surface carried by the other of said shafts, the traction surface of said inner roller extending into said ring roller such that an annular path of varying width is formed between the ring roller and said inner roller, three intermediate traction rollers positioned within said annular path in angularly spaced relation to each other, said five rollers having parallel axes of rotation, each intermediate roller contacting simultaneously said ring roller traction surface and said inner roller traction surface, one of said intermediate rollers being a wedging roller having 2° of freedom of movement in a plane perpendicular to the axis of the rollers, the two remaining intermediate rollers being reaction rollers each having at least 1° of freedom of movement in said plane, said ring roller having 2° of freedom of movement in said plane, the sum of the degrees of freedom of movement in said plane for all five said rollers being at least eight and not more than 10 when notional lines connect the centers of the said ring roller and said inner roller with the center of said wedging roller, said notional lines forming an angle which does not exceed twice the angle whose tangent is equal to the coefficient of traction.

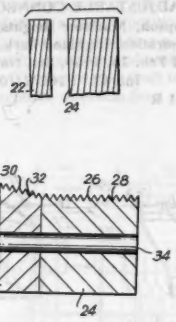
3,945,271
Patent Not Issued For This Number

3,945,272
THREAD-ROLLING METHOD, THREAD-ROLLING DIES, AND METHOD OF MANUFACTURING THE DIES

Leon Simons, New City, N.Y., assignor to NL Industries Inc., New York, N.Y.

Division of Ser. No. 7,280, Jan. 30, 1970, abandoned. This application June 11, 1974, Ser. No. 478,315
Int. Cl.² B21K 5/20; B21H 3/06
U.S. Cl. 76—107 R 2 Claims

2. In a method for manufacturing a thread-rolling die, the steps of milling into a blank surface of die block ridges and valleys extending along the milled surface to form a die face, then pressing across the thus-formed ridges a tool which forms in the ridges indentations distributed along lines which extend at a given angle across the ridges, so that the die can be used

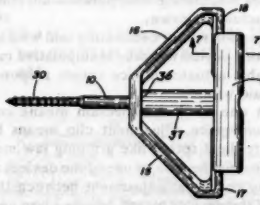


for forming lobular threads and then hardening the block, and finally grinding the sides and bottom thereof to prepare the block for use.

3,945,273
TIRE REPAIR TOOL

Charles M. Wolk, Canton, Ohio, assignor to E-Z Manufacturing Company, Canton, Ohio

Filed Dec. 4, 1974, Ser. No. 529,282
Int. Cl.² B60C 25/16
U.S. Cl. 81—15.7 9 Claims



1. A tire repair tool comprising,
a tube adapted to be inserted into a tire and to form a passageway through which tire repair material may be inserted through a wall of the tire,
a tube retainer including a handle,
an attaching member for attaching one end of the tube to the handle,
said attaching member being detachable from the handle to permit replacement of a fractured tube,

the handle has an aperture through which the tube extends and has a shoulder adjacent the aperture,

the tube has a shoulder which engages the shoulder on the handle to limit movement of the tube axially with respect to the handle in one direction, and wherein,

the attaching member operates to limit movement of the tube axially with relation to the handle in the opposite direction.

3,945,274

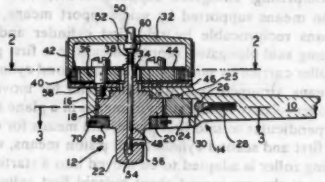
SPEED WRENCH

Charles E. Annett, II, P.O. Box 311, Mantolooking, N.J. 07838

Filed Aug. 13, 1975, Ser. No. 604,095

Int. Cl.² B25B *13/00*

U.S. Cl. 81—58.1 **8 Claims**



1. In a hand tool of the type having a rotatable output member and a handle connected by a ratchet means, the output member being selectively driven in either of two rotational directions by the ratchet means as the handle is turned, the improvement comprising:

a. a planetary gear system, including a ring gear, at least one planet carrier retaining and supporting a planet gear, and a sun gear connected to the output member;

b. a hand grip connected to the ring gear for restraining the ring gear against rotation at torques below a value determined by the restraining force applied to the hand grip by the hand of the operator;

c. means to couple said handle and said hand grip to an element of the planetary gear system so that turning the handle while the hand grip and the ring gear are held against rotation causes the output member to rotate at a greater rotational speed than the handle and thus to overrun the ratchet means, said ratchet means being automatically effective to engage the handle to the output member directly with no increase in rotational speed of the output member relative to the handle, when the torque on the ring gear exceeds the restraining force of the operator's hand on the hand grip.

3,945,275

ROTARY JAW CHUCK WITH STOCK DETECTOR

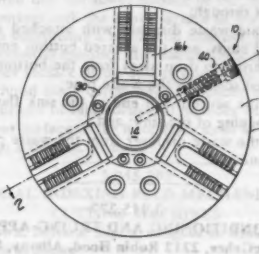
George J. Ovanin, Euclid, Ohio, assignor to The S-P Manufacturing Corporation, Solon, Ohio

Filed Feb. 1, 1974, Ser. No. 438,683

Int. Cl.² B23B *33/00, 31/30*

U.S. Cl. 82—40 R **10 Claims**

1. A rotary work holder comprising a chuck body adapted to be rotatably driven, a central opening through the body for receiving a portion of workpiece and through which the workpiece can be fed, a movable jaw carried by the chuck body adjacent a front face and movable relative to the chuck body to grip the workpiece beyond said opening, means within the chuck body about said opening movable relative to the body



for actuating said jaw, a member movable in the absence of a workpiece into said central opening at a location normally occupied by a workpiece gripped by the jaw, and means, with respect to which the chuck body is rotatable, sensitive to the position of said member in said central opening, to selectively permit or prevent work holder

---

3,945,276

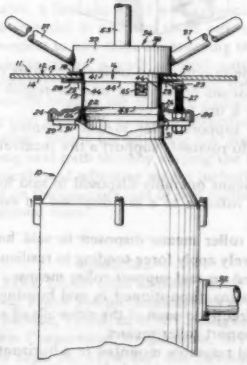
METHOD FOR REMOVING WASTE DISPOSERS

Ejnar Sorensen, P.O. Box 1362, Santa Monica, Calif. 90406

Division of Ser. No. 400,312, Sept. 24, 1973, abandoned. This application Feb. 7, 1975, Ser. No. 547,857

Int. Cl.² B23B *1/00*

U.S. Cl. 82—47 **1 Claim**



1. The method of removing a waste disposer from a kitchen sink, in which the disposer is secured to the bottom ends of the threaded studs that are screwed into a support ring surrounding the cylindrical throat of a sink flange and resting on a snap ring seated in a circumferential groove in the outer surface of

the flange throat, said threaded studs bearing upwardly at their top ends against a spacer ring abutting against the underside of the sink, said method comprising the steps of:

inserting a cutting tool, from above the sink, down into the throat of the sink flange;

positioning the cutters of the tool at a level between said spacer ring and said support ring;

rotating said tool from the sink, while gradually expanding the cutters outwardly until said sink flange throat has been cut through;

allowing said waste disposer with attached support ring, threaded studs, and the severed bottom end of the sink flange throat to drop away from the bottom of the sink, supported solely by the waste pipe;

removing the severed top end of the sink flange from the drain opening of the sink; and

removing the waste disposer from the waste pipe to which it is connected.

3,945,277

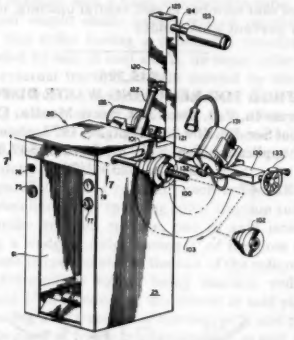
TIRE CONDITIONING AND TRUING APPARATUS

C. Bernie McGehee, 2212 Robin Hood, Albany, Ga. 31705; J. Samuel Rees, Rte. 1, Box 4, and Luther J. Johnson, Jr., P.O. Box 56, both of Preston, Ga. 31824

Division of Ser. No. 283,808, Aug. 25, 1972, Pat. No. 3,865,527. This application Sept. 6, 1974, Ser. No. 503,638

Int. Cl.² B23B *5/14*; B29H *21/08*

U.S. Cl. 82—51 **1 Claim**



1. Tire conditioning and truing apparatus comprising:

housing means defining an interior region dimensioned to receive a tire to be conditioned;

rotatable support roller means mounted in said housing means to rotatably support a tire received in said interior region;

motive means operably disposed in said housing means to impart rotation to a tire disposed on said support roller means;

pressure roller means disposed in said housing means to selectively apply force tending to resiliently deform a tire disposed on said support roller means;

heater means dispositioned in said housing means to apply heat directly to each of the sidewalls of a tire disposed on said support roller means;

a mandrel rotatably mounted in a horizontal plane on said housing means and including a tire connective portion;

cutting means supported by said housing means in proximate relation with respect to a certain location on the tread surface of a tire received on said connective portion; and

drive means mounted on said housing means for selective engagement with the tire tread surface in elevated relation to said certain location for imparting rotation to a tire received on said connective portion.

3,945,278

APPARATUS FOR MAKING RELIEF CUTS ON PREVIOUSLY SCORED GLASS SHEETS

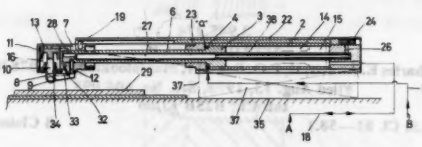
Gottfried Strauss, Durer-Strasse 24, Heiligenhaus, Germany, and Kurt Klotzbach, A-9210 Portschach, a.Ws., Sekull, Austria

Filed Apr. 23, 1975, Ser. No. 570,817

Claims priority, application Germany, Apr. 25, 1974, 2419998

Int. Cl.² B26D *3/08*; C03B *33/02*

U.S. Cl. 83—12 **12 Claims**



1. An apparatus for making relief cuts on pre-scored glass sheets, comprising: elongated support means, first cylinder and piston means supported by said support means, cutting head means reciprocable by said first cylinder and piston means along said elongated support means in a first plane, a cutting roller carried by said cutting head, second cylinder and piston means arranged at said cutting head for moving said cutting roller relative to said support means in a plane substantially perpendicular to said first plane, and means for controlling said first and second cylinder and piston means, whereby said cutting roller is adapted to be moved into a starting position adjacent the pre-scored sheet by said first cylinder and piston means moving in one direction in said first plane, said roller moved to a cutting position by said second cylinder and piston means, and said sheet relief-cut by said cutting roller in said cutting position during movement of said first cylinder and piston means in said first plane in a direction opposite to said one direction.

3,945,279

PROCESS AND APPARATUS FOR AUTOMATICALLY CUTTING OUT WORK PIECES IN ACCORDANCE WITH A PATTERN

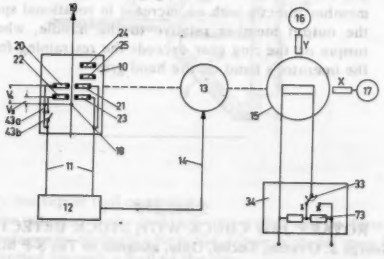
Dietrich Boehme, Kahl; Günter Hahn, Hausen; Gunter Schumann, Ober Roden, Messenhausen; Walter Wienen, Fellbach, and Rolf Jung, Waiblingen, all of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main and Krauss und Reichert, Feilbach, Stuttgart, both of, Germany

Filed May 7, 1974, Ser. No. 467,624

Claims priority, application Germany, May 18, 1973, 2325289; Sept. 29, 1973, 2349073

Int. Cl.² D06H *7/00*

U.S. Cl. 83—34 **17 Claims**



1. A process for controlling a cutting device which is automatically traversed by a drive mechanism controlled by a photoelectric scanning apparatus to cut a work piece in accordance with a pattern having a linear element comprising the steps of providing speed-changing marks alongside the linear

element, detecting the speed-changing marks by means of the scanning apparatus, and generating a control signal in the scanning apparatus in response to its detection of a speed-changing mark whereby the speed of the drive mechanism is correspondingly changed, the scanning occurs at variable overhanging distances at the front of the photoelectric scanning apparatus, and wherein the overhanging distance is varied after the speed of the drive mechanism has been changed, whereby the overhanging distance is longer for faster speeds of drive mechanism and shorter for slower speeds of the drive mechanism.

3,945,280

APPARATUS FOR CUTTING THREAD

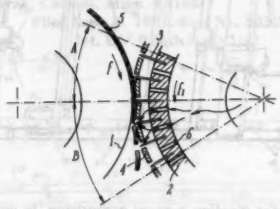
Giordano Roncato, Aix-les-Bains, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Mar. 21, 1973, Ser. No. 343,205

Claims priority, application France, Mar. 24, 1972, 72.10335

Int. Cl.² B26D 7/18

U.S. Cl. 83—98 **12 Claims**



1. Apparatus for cutting thread into short lengths comprising, a support element for supporting the thread to be cut, a rotatable cutting drum having a plurality of radially extending cutting blades positioned to engage the support element, means for supplying compressed gas from the interior of the cutting drum to the spaces between adjacent cutting blades for dislodging waste material from said spaces, and ejector means, including elongate ejector elements movable radially outwardly responsive to centrifugal force generated by rotation of the drum and positioned between the cutting blades for compressing the thread against the support element and for ejecting cut sections of thread from between the cutting blades.

3,945,281

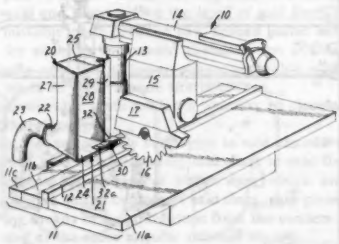
DUST COLLECTOR FOR RADIAL ARM SAWS

Lloyd D. Kreitz, P.O. Box 60, Pequot Lakes, Minn. 56472

Filed Aug. 5, 1974, Ser. No. 494,528

Int. Cl.² B27B 5/20; B27G 3/00; B26D 7/18

U.S. Cl. 83—100 **8 Claims**



1. In combination with a radial arm saw assembly comprising a horizontal work table which includes a front table, a rear table and a spacer board, a vertical column at the rear of said table, a horizontally adjustable arm rotatably attached to the upper end of said column so as to be positioned over said table, a rotary saw protected by a saw guard carried by said arm, a dust collector positioned at the rear of said table, said collector comprising a generally flat-bottomed funnel-shaped hood having a wide inlet which opens towards the front of said table, said inlet being positioned entirely above the plane of said table, said hood being arcuately movable,

the improvement which comprises said dust collector so positioned that the lower surface of the hood floor is in close contact with the upper surface of the spacer board, a clamp comprising a horizontal member, means holding said horizontal member in predetermined position above the upper surface of the spacer board, the lower surface of the hood floor contacting the spacer board and the lower surface of said horizontal member snugly engaging the upper surface of the hood floor so as to hold the hood firmly in a desired position.

3,945,282

MATERIAL INDEXING FEED MECHANISM FOR CUTTING MACHINES

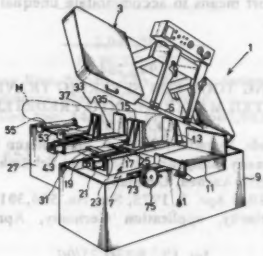
Tsuneo Aizawa, Isehara, Japan, assignor to Amada Company, Ltd., Isehara, Japan

Filed June 19, 1974, Ser. No. 480,728

Claims priority, application Japan, June 19, 1973, 48-71809

Int. Cl.² B26D 7/06

U.S. Cl. 83—247 **7 Claims**



5. Apparatus for cutting material in incremental lengths comprising a feed table, cutting means mounted at a cutting position and movable in a plane extending generally transverse to said table, a first vise fixed with respect to said table for holding the material in position to be cut, a second vise movable with respect to said table for indexing the material in incremental lengths along a path to said cutting position, means for moving said movable vise back and forth along said path, stop means for limiting the rearward extent of said movable vise along said path in a direction extending away from said cutting station, means for adjusting the position of said stop means along said path thereby varying the length of the indexing increment, said adjusting means including operating means disposed on the opposite side of said cutting plane from said first and second vises.

3,945,283

AXIAL LEAD DISPENSER HEAD

Albert W. Zemek; Frank Joseph Orzelek, both of Binghamton, and Mike L. Ziemba, Vestal, all of N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

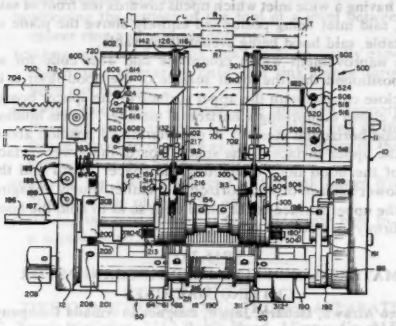
Filed Sept. 26, 1974, Ser. No. 509,482

Int. Cl.² B26D 7/06

U.S. Cl. 83—278 **8 Claims**

1. In an axial lead component dispensing apparatus having a support means, guide means including a pair of guide plates mounted on said support means for receiving a length of taped axial lead components between said plates, advancement means mounted on said support means for sequentially advancing said length of components, lead severing means

mounted on said support means for severing the taped portions of said leads from the remainder thereof, the improvement comprising actuator means mounted to said support means and connected to said pair of guide plates for moving said guide plates in the opposite lateral directions simultaneously relative to said support means to accommodate various length component leads, said activator means being laterally adjustably mounted to said support means for shifting the equidistant point of said guide plates relative to the centerline of said support means to accommodate unequal lead length components.



3,945,284

PARTING TOOL FOR SEVERING TRAVELING ELONGATED MATERIAL INTO PREDETERMINED LENGTHS

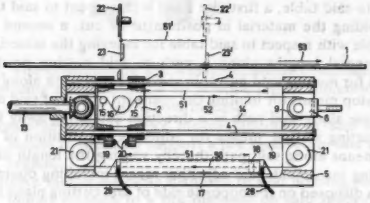
Walter Wetzels, Eynatten, Belgium, and Johann Greven, Aachen, Germany, assignors to Schumag Schumacher Metallwerke GmbH, Aachen, Germany

Filed Apr. 2, 1975, Ser. No. 564,301

Claims priority, application Germany, Apr. 4, 1974, 2416467

Int. Cl.² B23D *25/00*

U.S. Cl. 83—290 **11 Claims**



1. Parting device for severing a traveling elongated material into predetermined lengths, comprising track means, a tool slide carrying a parting tool and mounted on said track means for traveling thereon in a direction parallel to a path along which the elongated material travels past the parting device, said tool slide being displaceable at a speed in synchronism with that of the traveling elongated material as a predetermined length is being severed from the elongated material by said parting tool and being displaceable back to a starting position after the predetermined length has been severed, control means for initiating the foregoing displacements of said tool slide, reversible, flexibly yielding drive means ever actuatable for the severing operation and capable of imparting a travel speed to said tool slide greater than the synchronized speed without braking said tool slide, a member traveling at a speed continuously in synchronism with the travel speed of the elongated material, and over-running clutch means interposed between said tool slide and said member for limiting the speed of sid tool slide from exceeding said synchronous speed while permitting said tool slide to lag behind said member.

3,945,285

APPARATUS FOR SAWING A PANEL INTO PORTIONS

Fritz Gebhardt, Nurtingen, Germany, assignor to Karl M. Reich Maschinenfabrik GmbH, Nurtingen, Germany

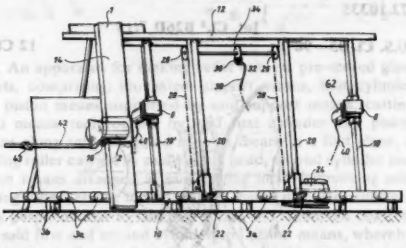
Division of Ser. No. 438,557, Feb. 1, 1974, Pat. No. 3,890,861.

This application Apr. 14, 1975, Ser. No. 567,885

Claims priority, application Germany, Feb. 6, 1973, 2305673; Dec. 1, 1973, 2359988

Int. Cl.² B27B *5/06*

U.S. Cl. 83—437 **7 Claims**



1. Apparatus for dividing a panel comprising, in combination:

a. a supporting frame defining a vertically extending plane of support for a panel to be divided;

b. saw means mounted on said frame for movement in horizontal and vertical paths in cutting engagement with a panel extending in said plane;

c. releasable clamping means on said frame for securing a panel in said plane; and

d. moving means mounted on said frame for moving a panel relative to said clamping means in said plane in a vertically extending direction.

3,945,286

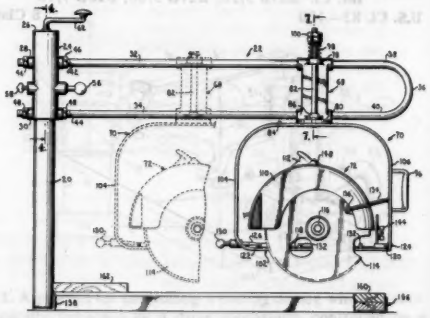
PORTABLE RADIAL ARM SAW

Roger W. Smith, 13120 Grandview Road, Grandview, Mo. 64030

Filed Nov. 8, 1974, Ser. No. 521,968

Int. Cl.² B27B *5/20*

U.S. Cl. 83—486.1 **13 Claims**



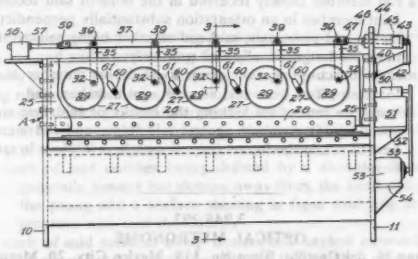
1. Radial arm saw apparatus comprising: a work-supporting surface;

an upright support adjacent said surface;
a pair of vertically spaced, upper and lower cantilever rails fixed to said support, extending generally horizontally therefrom above said surface, and each presenting an outer end remote from said support,
said rails lying in a common vertical plane;
a connecting member spanning the outer ends of said rails, rigidly joined to said ends and maintaining the same fixed relative to each other;
a power-driven saw unit;
a carrier beneath said lower rail receiving said unit and mounting the same in an operational position; and
means on said rails movable therealong and suspending said carrier therebeneath, whereby the carrier and hence the saw unit can be advanced along a path defined by said rails to make a cut in a workpiece positioned on said surface.

3,945,287
SHEET SHEAR

Jim Dvorak, Cosmos, Minn. 44106

Filed Sept. 6, 1974, Ser. No. 503,878
Int. Cl.² B26D *5/16, 5/42*
U.S. Cl. 83—628 **9 Claims**



1. A metal plate shears comprising in combination:
a frame including a pair of parallel end plates and a transverse frame member connecting said frame members,
a fixed connecting web supported by said transverse frame member,
a fixed blade supported by said connecting web,
a pair of spaced plates forming support means connecting said end plates above the level of said fixed blade,
a movable plate between said spaced plates and supported for slideable movement therebetween and having a cutting edge on its lower edge cooperable with said fixed blade to shear a plate therebetween,
said movable plate having a plurality of circular apertures therethrough,
disc means rotatably supported in said circular apertures,
means pivotally supporting said discs to said fixed support means for movement about axes which are eccentric relative to the centers of said discs, said pivotal supporting means being equidistant from the centers of the discs and at the same angular relation thereto,
means connected to said discs and extending through at least one of said spaced plates for rotating said discs about said eccentric axes, and
means connecting said connecting means for pivoting said discs in unison.

3,945,288
SAW CHAIN

Jaroslav Jiri Olmr, Columbia, S.C., assignor to Textron Inc., Providence, R.I.

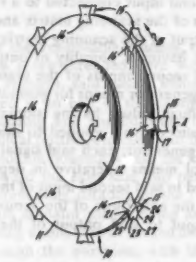
Filed Apr. 25, 1975, Ser. No. 571,574
Int. Cl.² B27B *33/14*
U.S. Cl. 83—834 **10 Claims**

1. A saw chain made up of a series of pivotally connected links including a plurality of bi-directional cutting links and a plurality of connecting links pivotally connected to and extending outward from opposing ends of each cutting link, each cutting link having an L-shaped cutting element with cutting edges along both the leading and trailing edges and legs extending angularly outward on opposite sides of the cutting element and each terminating in a depth gauge at its distal end and including a stop shoulder adapted for engagement with the connecting link.

3,945,289
SAW TOOTH

Guillermo Baez Rios, Mexico City, Mexico, assignor to Emilio Retana Rodriguez, Mexico City, Mexico

Filed Apr. 14, 1975, Ser. No. 567,883
Int. Cl.² B23D *61/06*
U.S. Cl. 83—853 **9 Claims**



1. A reversible self-sharpening saw tooth of truncated rectangular pyramidal configuration, with the smaller base adapted to be mounted on a carrier with the larger base facing outwardly of the carrier,
the outwardly facing surface of the larger base of the saw tooth being of concave configuration in a longitudinal direction corresponding to the direction of movement of the saw tooth in a cutting operation,
and at least one surface of the saw tooth being of concave configuration in a transverse direction so that the saw tooth affords four distinct cutting points located at the corners of the larger base, which four cutting points are maintained throughout substantial wear on the saw tooth.

3,945,290
DEVICE FOR PRODUCING A VIBRATO EFFECT FOR ACCOUSTIC SIGNALS

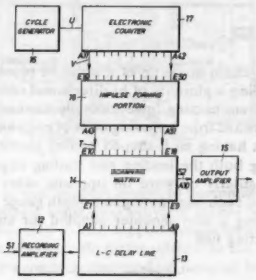
Wilfried Dittmar, Halsenbach, Hunsruck, Germany, assignor to Wersi-electronic GmbH & Co. KG, Halsenbach, Hunsruck, Germany

Continuation of Ser. No. 444,375, Feb. 21, 1974, abandoned. This application Feb. 20, 1975, Ser. No. 551,160

Claims priority, application Germany, Feb. 24, 1973, 2309293

Int. Cl.² G10H *1/02*; H03H *7/32*; H04R *3/00*

U.S. Cl. 84—1.25 **14 Claims**



1. Apparatus for producing vibrato effect acoustic signals, the apparatus comprising: delay means having an input to which in use said acoustic signals are supplied, and a plurality of outputs at which differently delayed output acoustic signals are developed when an acoustic signal is supplied to said input; a scanning matrix having a plurality of first inputs respectively connected to said outputs of the delay means, an equal plurality of second inputs, an output, and an equal plurality of signal coupling circuits each having a first input connected to a respective one of said first inputs of the scanning matrix, a second input connected to a respective one of said second inputs of the scanning matrix and an output connected to said output of the scanning matrix; and a scanning impulse generator having a plurality of outputs respectively connected to said second inputs of the scanning matrix and comprising signal generator means for generating pulse signals comprising individual pulses having sloping flanks, which pulse signals are successively applied to said outputs of the scanning impulse generator; each said signal coupling circuit comprising control means operative in dependence on the pulse signal applied to said second input of the signal coupling circuit to control the amplitude of the acoustic signal passed from said first input to said output of the signal coupling circuit.

3,945,291
DRUM CONSTRUCTION

William T. Zickos, 10212 W. 96th Terrace, Overland Park, Kans. 66212

Division of Ser. No. 511,217, Oct. 2, 1974. This application Feb. 27, 1975, Ser. No. 553,650

Int. Cl.² G10G *5/00*

U.S. Cl. 84—421 **2 Claims**

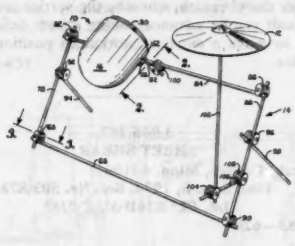
1. A framework for supporting a drum above a floor, said framework comprising:

a base engaging said floor;

at least one elongate frame member supported by said base and disposed upwardly of said floor;

a first joint member received on said frame member for selective pivotal and longitudinal movement with respect thereto, said first joint member including a pair of separable blocks having substantially flat surfaces positioned against one another, said blocks cooperating to present a bore through said first joint member of a size to closely receive said frame member;

a second joint member coupled to said first joint member at a location offset from said frame member, said second joint member being selectively pivotal with respect to said first joint member about a pivot axis oriented substantially perpendicular to said frame member, said second joint member including a pair of separable blocks having substantially flat surfaces positioned against one another, the blocks of said second joint member cooperating to present a bore through said second joint member, each



block of each joint member being independently movable relative to the other blocks;

a rod member closely received in the bore of said second joint member in an orientation substantially perpendicular to said pivot axis, said rod member being selectively movable longitudinally and rotatively;

means for coupling said drum to said rod member at a location offset from said second joint member; and

releaseable means for locking the blocks of said first and second joint members against said frame and rod members to retain the frame and rod members in place in said bores.

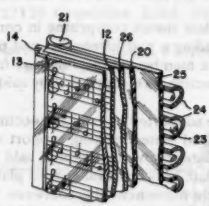
3,945,292
OPTICAL METRONOME

Juan M. del Castillo, Risco No. 119, Mexico City, 20, Mexico

Filed Mar. 13, 1975, Ser. No. 557,955

Int. Cl.² G04F *5/02*; G10G *1/00*

U.S. Cl. 84—484 **4 Claims**



1. An optical metronome for use with a sheet of music having lines of notes thereon and having at least translucent light characteristics for the passing of light therethrough comprising a belt allowing light to pass therethrough and having vertical lines thereon extending transversely of said belt,

rollers of which at least one is driven having said belt mounted thereon,

horizontal lighting means mounted between said rollers and behind said belt,

flat holding means for the sheet of music to hold the sheet of music in front of said belt,

said horizontal lighting means including a plurality of elongated horizontally extending lamps with each of said

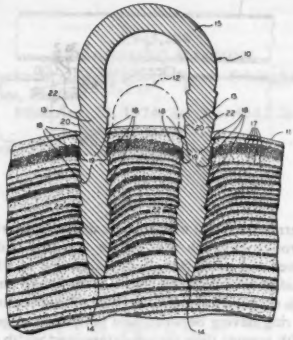
lamps substantially centered behind one of the lines of notes on said sheet of music.

3,945,293

HEAVY DUTY FASTENER AND METHOD OF MANUFACTURING SAME

Harry J. Krol, Arlington Heights, Ill., assignor to King-Koral, Inc., Glenview, Ill.

Filed Feb. 4, 1974, Ser. No. 439,571
Int. Cl.² F16B *15/06*
U.S. Cl. 85—49 **1 Claim**



1. A coined fastener having an elongated prong with a head at one end and a penetrating tip at its opposite end, and especially suitable for driving into wood across and into interlocking relation with the growth rings therein, comprising:

a series of longitudinally spaced coined interlock notches in at least one side of said prong, the prong being essentially of a uniform square-shaped cross-section;

each of said notches being defined by a shoulder facing generally toward but sloping away from the head end of the prong and a surface slanting in from said side to a juncture with said shoulder;

each of said surfaces being transversely arched outwardly intermediate the opposite sides of the notches whereby weakening of the prong is minimized; and

said shoulders being deepest at said opposite sides of said notches, including lateral projections aligned with the notches and derived from material displaced from said notches, wherein said projections are located at each side of said shoulders, and at each side of said surfaces, and provide projecting lips along the edges of said shoulders, wherein the included angle between said shoulders and said surfaces is about 90°, each notch being further defined as extending completely across the side of the fastener with the outer edge of the shoulder being generally convexly rounded at opposite ends thereof.

3,945,294

EXPANDABLE ANCHOR BOLT

Davis R. Jarman, Brunswick, Ga., assignor to Virgil Hinson, Brunswick, Ga., a part interest

Filed May 28, 1974, Ser. No. 474,079
Int. Cl.² F16B *13/04*
U.S. Cl. 85—63 **1 Claim**

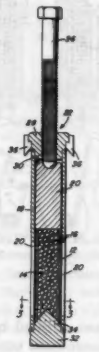
1. An anchor bolt, comprising, in combination:

a. an open ended expandable housing;

b. a fluid material arranged in the expandable housing;

c. support means including a casing provided with at least one slot arrangeable extending through a hole in a partition for positioning the expandable housing through the partition; and

d. actuator means for compressing the fluid material and causing same to expand the expandable housing when the latter is through the partition and prohibiting the housing and casing from passing back through the hole in the partition, the expandable housing being arranged in the casing for expansion through the slot, said casing being in the form of a length of tubing provided with a plurality of substantially parallel coextensive, lengthwise extending, normally closed slots adjacent an end of the tubing, the expandable housing is a sleeve arranged in the end of the tubing provided with the slots and constructed from a ductile material, and the fluid material is a plurality of balls, said actuator means including a generally cylindrical elongated piston movably and guidingly disposed in the casing and abutting an end of the expandable housing, a screw-threaded bolt connected to the piston and arranged extending from the casing in a direction away from the expandable housing, said bolt having a rounded end received in a socket in the end of the piston remote from the balls to maintain the threaded bolt in alignment with the piston and a cap mounted on an end of the casing



spaced from the expandable housing, the cap being provided with a screw-threaded bore with which the bolt threadingly engages, said casing being provided with a plug arranged at an end of the casing adjacent the expandable housing and spaced from the cap, the plug having a conical portion directed into the other open end of the expandable housing within the casing for wedging the balls toward the slots said cap being provided with means for preventing rotation of the cap relative to the partition, said actuator means being arranged extending from the casing at one side of the partition, and the casing extends through the partition, with the slots being arranged in a portion of the casing extending beyond the partition from a side of the partition spaced from the one side with the casing expanding to a size larger than the hole through the partition with the slots opening to permit the housing to expand to a size larger than the hole for engaging the periphery of the hole with a substantially continuous area of contact.

3,945,295

SOLENOID

Leslie P. Robison, Inyokern, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 10, 1974, Ser. No. 478,018
Int. Cl.² B64D *1/04*
U.S. Cl. 89—1.5 D **2 Claims**

1. A release mechanism comprising:

support means;

two substantially parallel support pins mounted in spaced relationship in said support means;

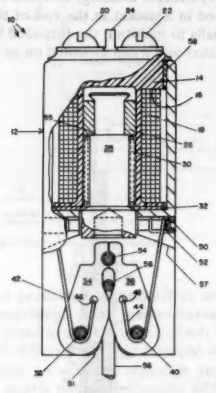
a retaining arm pivotally mounted on each of said pins;

a stop member mounted in said support means and having a longitudinal axis parallel to the axis of said pins; and lying in a plane equidistant between said pins;

said longitudinal axis being spaced from the plane containing the axis of said pins;

said arms having complementary shaped upper free ends mating with said stop means and meeting each the other along surfaces in said plane equidistant between said pins;

each said arm having a relieved portion along said surface between said stop and said plane containing the axis of said pins and forming, in closed position of said arms, an



opening therebetween formed by semicircular surfaces adjacent said stop means and tapered surfaces and terminating in contiguous surfaces remote from said stop means and between said stop means and said plane containing the axis of said stop means;

secondary shaped surfaces on said arms opposite the surfaces engaging said stop means and said secondary surfaces being parallel to the mating planes of said first mating surfaces;

latching means mounted on said support and selectively movable from a normal position free of said secondary surfaces to a latching position engaging the said secondary surfaces to prevent separation as said arms; and

spring means urging said arms to said closed position.

3,945,296

GAS PISTON IN A FIREARM

Timo Hyytinen, Jyvaskyla, Finland, assignor to Valmet Oy, Finland

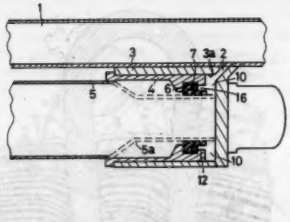
Filed Mar. 11, 1974, Ser. No. 450,381

Claims priority, application Finland, Mar. 12, 1973, 750/73

Int. Cl.[2] F41D 5/10

U.S. Cl. 89—191 A **3 Claims**

1. In a firearm, outer and inner coaxial bodies arranged with said outer body surrounding and spaced at least partly from said inner body with said outer body having an inner cylindrical surface of circular cross section surrounding and spaced from an outer cylindrical surface of circular cross section of said inner body so that said surfaces define between themselves a cylindrical space of a given thickness, a piston comprising a substantially rigid cylindrical member extending at least partly into said space and having in the latter space an end region fluid-tightly and slidably engaging one of said surfaces and extending from said one surface toward but terminating short of the other of said surfaces so that said end region has a thickness less than said predetermined thickness, said end region of said member terminating in an end face and being formed inwardly of said end face with a circular groove directed toward said other surface and defining with said end face a lip having a peripheral edge also directed toward said other surface, an elastic sealing ring fluid-tightly and slidably engaging said other surface and having at one end a flange extending into said groove and spaced from said lip, said sealing ring having a cylindrical wall extending from said flange toward said lip and defining with said lip a circular gap



of predetermined radial width, and a springy snap ring situated in said groove between said flange and lip, said snap ring having inner and outer peripheral edges one of which is situated in said groove between said lip and flange and the other of which is situated adjacent said wall of said sealing ring, and said snap ring having between said peripheral edges thereof a radial width greater than the predetermined width of said gap, said end region of said member engaging the inner surface of said outer body while said sealing ring engages the outer surface of said inner body so that said end region of said member surrounds said sealing ring and said snap ring.

3,945,297

MACHINE TOOL SPINDLE CALIBRATION METHOD AND APPARATUS

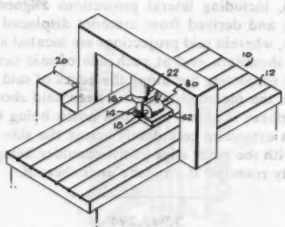
Clive P. Hohberger, Port Jefferson, N.Y., assignor to Allen-Bradley Co., Milwaukee, Wis.

Division of Ser. No. 268,743, July 3, 1972, Pat. No. 3,827,293.

This application Apr. 15, 1974, Ser. No. 460,802

Int. Cl.[2] B23Q 11/04; G05B 5/00

U.S. Cl. 90—11 C **3 Claims**



1. A method for accurately operating a machine tool that includes a workpiece-holding bed, as rotatable spindle, a drive that produces relative translation of the spindle to the bed, a spindle deflection sensor, and a machine control which controls the drive, comprising:

mounting a cutter on said spindle;

mounting force measuring apparatus on said bed of said machine tool;

creating movement of said spindle apparatus relative to said bed so that a predetermined portion of said cutter contacts and is forced against said force measuring apparatus;

measuring the deflection of said spindle sensed by said spindle deflection sensor when said force measuring apparatus is forced against said cutter;

mounting a workpiece on said bed;

rotating said cutter while it is held in substantially the same position on said spindle as it had when it contacted said force measuring apparatus; and

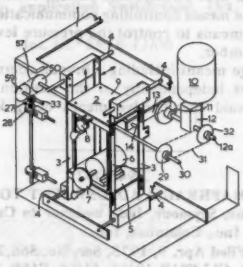
operating said machine control to move said cutter into said workpiece at a rate which causes said spindle to be deflected by an amount which is a predetermined ratio of the deflection of said spindle which was sensed when said force measuring apparatus was forced against said cutter.

3,945,298

KEY CUTTING MACHINE

Darrel Cockroft, 232 Bradford Road, Frizinghall, Shipley, Yorkshire, England

Filed Apr. 25, 1974, Ser. No. 464,226
Int. Cl.² B23C 1/16
U.S. Cl. 90—13.05 **11 Claims**



1. Appparatus for producing copies of cut keys, the apparatus comprising:

cut key clamping means for clamping a cut key which is to be copied during use of the apparatus;

uncut key clamping means for clamping an uncut key which is to be cut;

a stylus engageable with the contours of the cut key held by said cut key clamping means; a power driven cutter engageable with the uncut key held by said uncut key clamping means; a carriage coupling the stylus and power driven cutter together for movement in unison;

a driving mechanism operable to drive the carriage and thereby drive the coupled stylus and cutter through a working stroke along the length of the cut and uncut keys respectively, and then drive the coupled stylus and cutter through a return stroke;

mounting means mounting the carriage to permit movement of the coupled stylus and cutter transversely of the cut and uncut keys respectively during the working stroke; and displacement means which acts on the carriage on commencement of the return stroke to move the stylus and cutter laterally clear of the cut and uncut keys respectively.

3,945,299

LINEAR POSITIONING APPARATUS

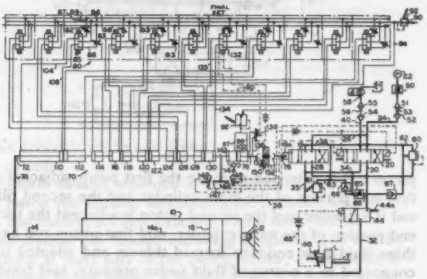
Rene E. Fritz, Albany, and Ted C. Foster, Corvallis, both of Oreg., assignors to Albany International Industries, Inc., Albany, Oreg.

Filed June 24, 1974, Ser. No. 482,446
Int. Cl.² F15B 13/04
U.S. Cl. 91—31 **25 Claims**

1. In a positioning apparatus having a large-stroke fluid-operated, double-acting master cylinder means for controlling the position of a variable position controlled device, a train of smaller-stroke fluid-operated control cylinder means additively interconnected and mounted for axial linear movement, means for selectively extending and retracting selected individual control cylinder means to determine the total length of said train, and servo valve means for controlling the flow of pressure fluid to and from said master cylinder means, characterized by:

said train of control cylinder means including a series of double-acting control cylinder means each normally biased by internal fluid pressure in either one of its two bottomed positions and each being selectively movable independently of the others under internal fluid pressure to the other of its two bottomed positions,

one end of said cylinder train being rigidly connected by feedback means to a means positionable by said master cylinder means and the other end of said cylinder train being mechanically connected to said servo valve means for controlling the operating positions thereof such that



admission of pressure fluid to one side of a selected said control cylinder means in sequence (1) first causes said selected control cylinder means to begin stroking toward the opposite side thereof by moving at least a portion of said train in one direction to shift said servo valve means to an operating position to begin stroking said master cylinder means, (2) then causes said selected control cylinder means to continue stroking toward said opposite side to a bottomed position as induced by continued stroking of said master cylinder means acting through said feedback means and (3) finally causes said train to shift said servo valve in an opposite direction to a neutral position through continued stroking of said master cylinder means acting through said feedback means to block flow to and from said master cylinder means whereby said master cylinder means is stroked through a distance corresponding to the full stroke of said selected control cylinder means.

3,945,300

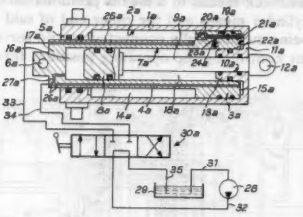
TELESCOPIC JACK

Bernard M. Bourges, Le Plessis-Belleville, France, assignor to Societe Anonyme: Poclain, Le Plessis-Belleville, France

Filed Dec. 3, 1974, Ser. No. 529,213
Claims priority, application France, Dec. 3, 1973, 73.43049
Int. Cl.² F01B 7/20
U.S. Cl. 91—173 **3 Claims**

1. A fluid controlled telescopic jack comprising a main cylinder having first and second opposite end portions, a first piston rod located in said main cylinder and extending through the first end portion thereof in fluid tight relation for sliding movement between extended and retracted positions, said first piston rod having a hollow bore formed therein opening towards the second end portion of said main cylinder, a first piston surrounding a portion of said first piston rod and slidable in said main cylinder housing in liquid tight relation with the interior walls thereof, said first piston being located on said first piston rod, when the first piston rod is in its retracted position, adjacent and slightly spaced from said second end portion of the main cylinder to define a first chamber between the first piston and the first end portion of the main cylinder

and a second chamber between the first piston and the second end portion of the main cylinder; a second piston located in the bore of the first piston rod and slidable therein in fluid tight relation; a second piston rod secured to said second piston and extending therefrom through the second end portion of the main cylinder in fluid tight relation for movement between extended and retracted positions, said second piston defining, in the retracted position of said piston rods, a third chamber in the bore of said first piston rod and a fourth chamber between the second piston and the second end portion of said main cylinder, whereby said first piston rod and said second piston are separable and are separated when the first



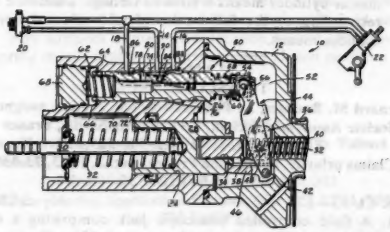
piston rod is extended to move the first piston adjacent said first end portion of the main cylinder and the second piston rod is extended and the second piston is adjacent the second end portion of the main cylinder, said first piston rod having three fluid flow conduits formed therein and adapted to be connected to a source of fluid under pressure, said conduits including a first conduit connecting said source of fluid to said first chamber, a second conduit connecting said source of fluid to said second chamber and a third conduit connecting said second conduit to said third chamber whereby said second and third chambers are simultaneously supplied with fluid to extend said first piston rod before said second piston rod.

3,945,301

SPOOL VALVE FOR HYDRAULIC BRAKE BOOSTER

Stephen M. Buente, and Lloyd G. Bach, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Apr. 1, 1974, Ser. No. 456,934
Int. Cl.² F15B *13/10, 11/08, 13/04*
U.S. Cl. 91—442 **7 Claims**



1. In a hydraulic brake booster:

a housing defining a pressure chamber therewithin;

said housing having an inlet communicated to a fluid pressure source and an outlet;

valve means movable within said housing from a first position venting said pressure chamber and preventing communication from the inlet to the pressure chamber to a second position, said valve means communicating successively higher fluid pressure levels from said inlet into said pressure chamber as the valve means is shifted from said first position;

an output piston slidably mounted in said pressure chamber and responsive to the fluid pressure communicated into the latter;

operator-actuated means for operating said valve means; and

means for releasing the fluid pressure level in the pressure chamber when the pressure level at the inlet is less than the pressure level in the pressure chamber;

said last-mentioned means being check valve means controlling communication between said pressure chamber and the inlet;

said check valve means permitting communication between the pressure chamber and the inlet whenever the pressure level in the pressure chamber exceeds the pressure level in the inlet, but prohibiting communication in the reverse direction;

passage means extending through said valve means to communicate said inlet with said pressure chamber as the valve means is moved away from the first position, said passage means venting the pressure chamber when the valve means is in the first position and communication from said inlet through said passage means is prevented, said valve means controlling communication through said passage means to control the pressure level in the pressure chamber;

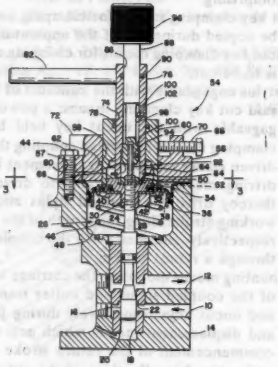
said passage means including a branch communicated with said inlet independently of the position of said valve means, said check valve means being located in said branch.

3,945,302

DIAPHRAGM ADJUSTMENT TOOL

Ronald Downs, Seymour, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Apr. 9, 1975, Ser. No. 566,292
Int. Cl.² F01B *19/00, 31/14;* **F15B** *15/24*
U.S. Cl. 92—13.2 **10 Claims**



1. Apparatus for adjusting the relative position of a central shaft of a pressure responsive diaphragm assembly positioned in a recess in a housing, said diaphragm assembly including locking means for selectively engaging and disengaging said central shaft with said diaphragm assembly, said apparatus comprising:

a base plate releasably and sealingly secured to said housing over said recess, said base plate having means defining an opening therethrough generally in line with said central shaft and locking means;

a first element telescoped through and sealingly engaging said opening, said first element being connectable with said locking means and displaceable relative to said base plate for selectively engaging and disengaging said lock-

ing means, said first element having an opening therethrough,

a second element telescoped through and sealingly engaging the opening through said first element, said second element including means for interconnecting said second element with said central shaft and displaceable relative to said base plate for varying the position of said central shaft relative to said diaphragm assembly when said locking means is disengaged;

said base plate including means for connecting a source of pressurized fluid to said recess whereby the position of said central shaft is adjustable under conditions in which said diaphragm is exposed to pressure.

3,945,303

HYDROSTATIC PISTON MACHINE

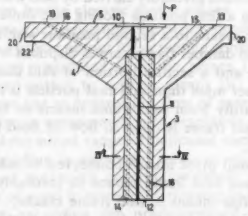
Anton Steiger, Illnau, Zurich, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Oct. 7, 1974, Ser. No. 512,851

Claims priority, application Switzerland, Oct. 10, 1973, 14410/73

Int. Cl.² F01B *13/06*

U.S. Cl. 92—58 **6 Claims**



1. A hydrostatic piston machine comprising

a guide member having an axis and a plurality of internal plane guide surfaces thereon, said guide surfaces being disposed tangentially of a common circle;

a cylinder block mounted within said guide member about an axis eccentric to the axis of said common circle;

a plurality of pistons movably mounted in the periphery of said block in a radiating pattern, each said piston having a foot at an outer end including a plane rectangular bearing surface guided along a respective one of said guide surfaces of said guide member, each said piston having an axis disposed perpendicularly of said respective guide surface; and

a hydrostatic stabilizing means in said bearing surface of each said piston for maintaining said axis of each said piston perpendicularly of said respective guide surface during operation, said means including a hydrostatic bearing pocket concentric to said piston axis, a plurality of feed openings in corner zones of said bearing surface, a throttle passage communicating said pocket with an inner end face of said respective piston and a plurality of throttle passages for a flow of hydraulic pressure medium extending through a respective piston from said inner end face and terminating in said feed openings.

3,945,304

ACTUATORS

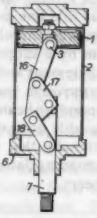
Roger Keith Taylor, North Wembley, England, assignor to Tourdelos Limited, England

Continuation of Ser. No. 269,225, July 5, 1972, abandoned. This application Aug. 5, 1974, Ser. No. 495,051

Claims priority, application United Kingdom, July 5, 1971, 31441/71

Int. Cl.² F01B *9/00*

U.S. Cl. 92—140 **11 Claims**



1. An actuator which comprises:

a. a cylinder,

b. a piston slidably mounted in the cylinder,

c. a piston rod slidably mounted in the cylinder, and

d. a mechanical linkage arranged within the cylinder,

e. the mechanical linkage including a rigid link on which, during at least part of the piston stroke, a first point is coupled to the piston, a second point is coupled to the piston rod and a third point is coupled to a wall of the cylinder,

f. the distance of the first point from the third point being greater than the distance of the third point from a line through the second point parallel to the direction of movement of the piston rod and during at least part of the stroke the first point and the third point are on opposite sides of the said line so that the mechanical advantage of the link is transmitting force from the piston to the piston rod is greater than one.

3,945,305

CARDBOARD BLANK FOLDING MACHINE

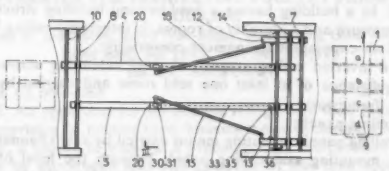
Jean-Jacques Barny, Lyon, France, assignor to S.A. Martin, Saint-Priest, France

Filed Feb. 25, 1975, Ser. No. 552,781

Claims priority, application France, Feb. 28, 1974, 74.06762

Int. Cl.² B31B *1/26*

U.S. Cl. 93—49 R **4 Claims**



1. In a machine for folding a cardboard blank, in which a flat blank with fold lines impressed into it enters said machine and extreme lateral panels of said blanks are folded towards the centre of said blank along said fold lines, said machine comprising:

means for advancing said blanks in the direction of extent of said fold lines,

two longitudinal beams disposed one on each side of said machine,

means permitting transverse movement of said beams to enable said beams to be set transversely according to the dimensions of said blank at right angles to said fold lines,

two lateral elements disposed one on each side of said machine,

means permitting transverse movement of said elements to enable said elements to be set transversely according to said dimensions of the blank and adjacent the lateral edges of said blank before folding,

two folding bars disposed one on each side of said machine, each said bar forming a ramp, inclined to the horizontal and vertical planes, for forcing said extreme lateral panel to fold itself along said fold line as said blank advances in the machine, the improvement wherein each folding bar is supported upstream by a support means fixed to said corresponding lateral element and downstream by a support means which is movable vertically in a guide supported by said corresponding beam, and vertical displacement of each said movable downstream support means is directly and proportionally tied to transverse displacement of said corresponding lateral element relative to said corresponding beam.

3,945,306

INTEGRATED CEILING LIGHT AND AIR-CIRCULATION ARRANGEMENT

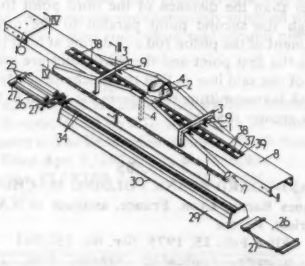
David James Brown, Winchester, England, assignor to Conder International Limited, Winchester, England

Filed Jan. 15, 1974, Ser. No. 433,524

Claims priority, application United Kingdom, Jan. 17, 1973, 2549/73

Int. Cl.² F24F 7/06

U.S. Cl. 98—40 DL **8 Claims**



1. In a building having a load-bearing building structural framework and a plurality of rooms, in integrated ceiling light and air-circulation arrangment comprising:

an inverted ceiling support channel extending across the distance of at least one said room and carried by the framework;

ceiling panels;

ceiling panels mounting means carried by said channel and mounting said ceiling panels beneath the level of the lowermost portion of said channel, said panels extending beneath a first part of the length of said channel;

lighting element mounting means within said channel for mounting at least one lighting element within a second part of the length of said channel;

air injection means comprising injection aperture means extending along and outside each side of said second part of said channel, for injecting air into said room; and

air withdrawal aperture means in the upper portion of said second part of said channel, for withdrawing air from said room.

3,945,307

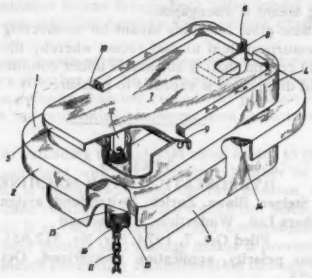
CHIMNEY DAMPER ARRANGEMENT

Bentford C. Lyemance, 502 Wilderness Road, Louisville, Ky. 40216

Filed Oct. 21, 1974, Ser. No. 516,178

Int. Cl.² F23L 17/02

U.S. Cl. 98—60 **7 Claims**



1. A chimney flue damper and closure arrangement including:

a. frame means of substantially rectangular shape to be disposed within the outlet from a chimney flue to define an outlet from said chimney flue;

b. sleeve means extending downwardly from said frame means into said flue;

c. damper flap means pivotably carried by said frame means to rotate from a first position closing said outlet defined by said frame means to a second position wherein a first portion of said damper flap means is disposed within said chimney flue and a second portion of said damper flap means of lesser mass than said first portion is rotated to extend outwardly from said frame means so said outlet defined by said frame is open to flow of fluid from said chimney flue;

d. first and second pivot means connected to said damper flap means and said frame means to pivotably connect said damper flap means to said frame means;

e. upstanding lip means carried around a portion of the periphery of the first portion of said damper flap to extend generally laterally from said damper flap;

f. downwardly opening channel means carried by said frame means around a portion of said outlet defined by said frame means to receive said upstanding lip means of said damper flap means to provide seal means when said damper flap is in said first position.

3,945,308

LIMITING CONTROL ARRANGEMENT FOR EXHAUST SYSTEM OPERATION

Christopher Jakimowicz, Detroit, and Thomas G. Duford, Trenton, both of Mich., assignors to National Steel Corporation, Pittsburgh, Pa.

Filed July 26, 1974, Ser. No. 492,323

Int. Cl.² F23J 11/00

U.S. Cl. 98—115 R **4 Claims**

1. A system for maintaining a continuous subatmospheric gas pressure in a gas exhaust system comprising

a. a canopy for enshrouding a coke oven discharge area, the canopy having portions in communication with the atmosphere,

b. an exhaust manifold having a plurality of gated inlets,

c. a duct connected at one end to the interior of the exhaust manifold,

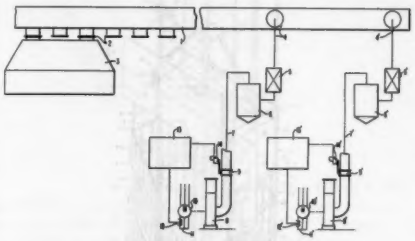
d. blower means connected to the interior of the duct at a point spaced from the exhaust manifold for applying subatmospheric gas pressure to the interior of the exhaust manifold through the duct,

e. means for periodically selectively connecting one or more gated inlets to the interior of the canopy to place the interior of the exhaust manifold in gaseous communication with the interior of the canopy to thereby cause a draft to flow through the canopy from the atmosphere, through the exhaust manifold, through the duct and through the blower, there being no opening in the duct nor the exhaust manifold other than the connected gated inlet or inlets,

f. electric motor means connected to the blower means for driving the blower means,

g. valve means in the duct for controlling the flow of gases through the duct to the blower means,

h. control means for actuating valve means (g),



i. means for continuously measuring the amplitude of the current drawn by the electric motor means and producing a signal proportional to the amplitude of the current drawn by the electric motor means,

j. means for translating the signal produced by means (i) into a power output for actuating control means (h), and

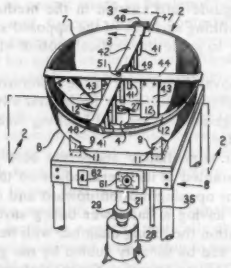
k. means associated with the means (j) for varying the power output to actuate means (h) and thereby valve means (g) to control the flow of gases in direct relation to signals corresponding to amplitude of current within a predetermined range of indicated current amplitude and responding to signals indicating an approach to predetermined maximum current amplitude by controlling the flow of gases in inverse relationship to prevent the current from exceeding the predetermined maximum current amplitude.

3,945,309

COOKING APPARATUS FOR LOOSE FOOD PRODUCTS

Vernon J. Moran, Atherton, Calif., assignor to Bomor Equipment, Inc., Atherton, Calif.

Filed Dec. 2, 1974, Ser. No. 528,686
Int. Cl.² A47J 27/14
U.S. Cl. 99—348 **8 Claims**



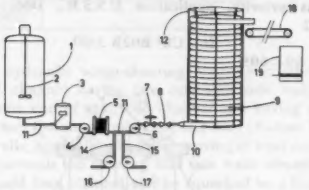
1. Apparatus for processing loose food products comprising a bowl, a rotatable drive shaft extending through the bottom of the bowl and which is drivable from below said bowl bottom, a scraper blade fixed for rotation with said drive shaft adjacent the bowl bottom to scrape product off the bottom, support means removably mounted on the rim of the bowl, and a plurality of downwardly extending prongs carried by said support means and extending across said bowl to break up product carried by the blade as the drive shaft is rotated, said support means comprising a first bar extending across the top of the bowl carrying said downwardly extending prongs, a second bar extending across the top of the bowl transversely with respect to the first bar so as to intersect the first bar and carrying downwardly extending paddles, means for securing said bars together at their intersection, and means for latching the respective ends of at least one of said bars to the top rim of the bowl.

3,945,310

APPARATUS FOR THE CONTINUOUS PRODUCTION OF CURDS

Pierre Stenne, Lozon, France, assignor to Claudel S.A., Hauts-de-Seine, France

Division of Ser. No. 393,848, Sept. 4, 1973, Pat. No. 3,899,595. This application Sept. 5, 1974, Ser. No. 503,535
Claims priority, application France, Sept. 4, 1972, 72.31234; Apr. 16, 1973, 73.13766
Int. Cl.² A23C 19/02
U.S. Cl. 99—452 **11 Claims**



1. An apparatus for the continuous production of curds for use in cheese making, comprising at least one coagulation unit in the form of a conduit in which the coagulum is formed, means for introducing and circulating renneted milk in this conduit, the term "renneted milk" indicating herein milk to which has been added one or more substances promoting the formation of a coagulum, such substances including enzymatic systems of which rennet is an example, acid substances and lactic ferments, and means for applying a pulsating effect to the flow of milk introduced into the conduit, and wherein the wall of this conduit is capable of being deformed under the effect of these pulsations.

3,945,311

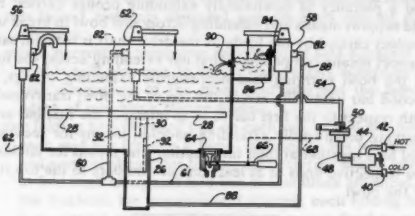
APPARATUS FOR PRE-HEATING POULTRY PRIOR TO COOKING

Geno N. Gasbarro, 1305 Noe-Bixby, Columbus, Ohio 43227

Filed Aug. 16, 1973, Ser. No. 388,826
Int. Cl.² A47J 30/24
U.S. Cl. 99—483 **2 Claims**

1. An apparatus for pre-heating refrigerated food products comprising, in combination, housing means including a reservoir; a supply of water at a predetermined temperature that can be introduced into said reservoir at less than approximately 160° F; valve means communicating with said reservoir and with said supply of water to control the flow rate introduced into said reservoir; tray means mounted in said reservoir and adapted to receive said food products; a piston mounted for reciprocating in a cylinder, said piston being in force-transmitting engagement with said tray means for predetermined repetitive movement of said tray means in said reservoir; and control means for effecting reciprocation of said piston including a chamber provided with an inlet and an outlet and valve means communicating a source of water to

said chamber and to said cylinder, said valve means being responsive between on and off positions to the level of water



in said chamber which in turn is responsive to the relative flow rates between said chamber inlet and outlet.

3,945,312

APPARATUS FOR SEPARATING SEED COVER FROM ENDOSPERM OF GRAIN OF VARIOUS CEREAL CROPS

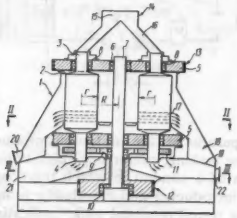
Vasily Nikolaevich Borisov, ulitsa Baumana, 14, Kv. 12; Evgeny Alexandrovich Akulov, ulitsa Totmina, 13a, Kv. 53, and Alexei Ivanovich Solovei, ulitsa 4 Prigornaya, 22, all of Krasnoyarsk, U.S.S.R.

Filed Oct. 25, 1974, Ser. No. 518,143

Claims priority, application U.S.S.R., Dec. 19, 1973, 1974602

Int. Cl.² B02B *3/00*

U.S. Cl. 99—605 **5 Claims**



1. An apparatus for separating seed cover from endosperm of grain of various cereal crops comprising: a hollow casing; a container for grain mounted in said casing for rotation about its own axis; at least one more container for grain mounted in said casing in parallel with the first container for rotation about its own axis, said second container being associated with the first container for combined rotation therewith about a common axis of rotation extending in parallel to the own axes of rotation thereof; means for charging grain communicated with said containers; a collector for the removed seed covers communicated with said containers; a collector for endosperm of grains communicated with said containers; means for rotating said containers about their own axes; means for rotation said containers about said common axes of rotation thereof extending in parallel with their own axes; the ration of the angular speeds of rotation of each said container about its own axis and about the common axis of rotation of the containers complying with the condition:

$$\Omega^2(R-r) > \omega r ,$$

wherein

ω is angular speed of rotation of the container about the common axis of rotation;

R is distance from the common axis of rotation to the own axis of rotation of the container;

ω is angular speed of rotation of the container about its own axis;

r is radius of the container.

3,945,313

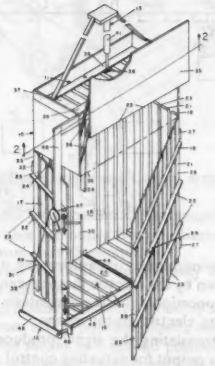
VERTICAL BALER

Harold L. Komberec, and Dillon K. Kilcup, both of Spokane Industrial Park. Bldg. 13, Spokane, Wash. 99216

Filed Feb. 6, 1975, Ser. No. 547,734

Int. Cl.² B65B *13/18*; B30B *15/32*

U.S. Cl. 100—34 **2 Claims**



1. A baler for waste products comprising, in combination:

a baler frame structure having a bale removal door and providing spaced slat-like elements defining the bottom, two vertical sides, the front and back of a rectilinear baling chamber, the slats in the vertical surfaces being vertically oriented and those in the bottom being aligned with the vertical slats to form continuous channels in the baling chamber periphery with plural baling wire hooks carried by the baler frame structure in the said channels in the upper part of the back and plural spaced wire holders adapted to releasably hold baling wire in plural channels extending downwardly along the back from the baling wire hooks across the bottom and upwardly on the front to the top of said bale removal door, and vertically positioned guide rails carried in the medial part of the chamber defining surfaces of the opposed sides and back of the baler to guide the vertical motion of a baling ram therein;

said bale removal door being in the lowermost part of the front pivotably mounted for horizontal swing motion at one side edge and having first latching means at the second side edge;

an input door immediately above the bale removal door hingably mounted at its lateral edges on the baler frame structure for opening motion upward and outwardly;

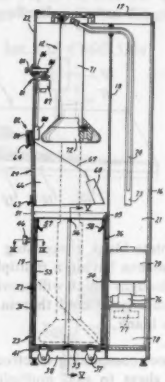
a baling ram having a flat lower baling surface vertically movable within the baling chamber with bearing surfaces to fit upon and be slidably guided by the guide rails carried on the baling chamber facing surfaces of the baler frame structure; and

hydraulic means of vertically moving the baling ram within and above the baling chamber responsive to manually activated electric controls.

3,945,314
WASTE COMPACTOR WITH CLAMSHELL BAG SUPPORT

Ransom J. Hennells, Plymouth Township, Wayne County, Mich., assignor to Compactor Company, Inc., Belleville, Mich.

Filed Oct. 16, 1972, Ser. No. 297,822
Int. Cl.² B30B 15/16
U.S. Cl. 100—53 11 Claims



1. A waste compactor for permitting the depositing and compacting of waste within a flexible bag, comprising:

housing means;

extendible ram means mounted on and positioned adjacent the upper end of said housing means, said ram means being movable downwardly for permitting compacting of waste;

removable dolly means coacting with the lower end of said housing means and including bottom wall means positionable directly beneath said ram means when said dolly means is in a first position permitting compacting of waste, said dolly means having support roller means thereon and being movable outwardly relative to said housing means to a second position wherein said dolly means is laterally spaced from said ram means, said dolly means when in said second position permitting a flexible bag to be mounted thereon or removed therefrom;

support means removably positioned and supported on said bottom wall means of said dolly means in a free-standing manner for supporting a flexible bag in an open upright position to permit waste to be deposited and compacted therein, said support means comprising an elongated tubelike assembly of substantially rectangular cross section and having an unobstructed vertical opening extending therethrough, said tubelike assembly being positioned in the interior of said bag for maintaining said bag in an open upright condition in surrounding relationship to said tubelike assembly, said tubelike means and said surrounding bag being supported on said bottom wall means and disposed beneath said ram assembly when said dolly means is in said first position;

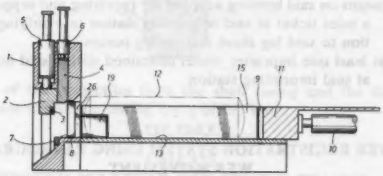
said tubelike assembly being of a clamshell-like construction and including a pair of vertically extending elements positioned in opposed relationship to one another so as to define said vertical opening therebetween, at least one of said elements having a channel-shaped cross section, and means hingedly interconnecting said pair of elements adjacent the upper ends thereof for enabling the lower ends of said elements to be vertically pivotally swung toward and away from one another; and

said dolly means including stop means fixed thereon for overlapping the lower free ends of said elements when the tubelike assembly is positioned on the bottom wall means for preventing said elements from swinging outwardly away from one another when waste is being compacted in the interior thereof by said ram means.

3,945,315
HYDRAULIC SCRAP SHEARING MACHINE

Peter Dahlem, Hilden, and Hubert Milles, Dusseldorf, both of Germany, assignors to Lindemann Maschinenfabrik GmbH, Dusseldorf, Germany

Filed Apr. 16, 1975, Ser. No. 568,388
Claims priority, application Germany, May 13, 1974, 2423003
Int. Cl.² B30B 9/32
U.S. Cl. 100—95 5 Claims



1. In a hydraulic scrap-shearing machine comprising an open feed channel having two opposing side walls, scrap shears at one end of said feed channel and having a mouth narrower than the normal width of said feed channel between said side walls, hydraulic means for moving at least one of said side walls towards the other of said side walls whereby scrap placed in said feed channel can be squashed to a final width no greater than the width of said mouth of said scrap shears, and a feeder ram for pushing scrap along said feed channel into said mouth of said scrap shears, the improvement consisting of said movable one of said side walls being divided into two longitudinal portions of different lengths, and said hydraulic means comprising a main hydraulic ram having a working face forming the longer portion of said movable side wall, and an auxiliary hydraulic ram having a working face forming the shorter portion of said movable side wall just upstream of said mouth of said scrap shears, said auxiliary hydraulic ram being capable of operation independently of said main hydraulic ram.

3,945,316
PORTABLE TRANSACTION-LOG RECORDER

Morton W. Thomson, Castro Valley, and Mitchel A. Trout, Albany, both of Calif., assignors to Dymo Industries, Inc., San Francisco, Calif.

Filed Jan. 17, 1974, Ser. No. 434,209
Int. Cl.² B41F 3/04
U.S. Cl. 101—45 15 Claims

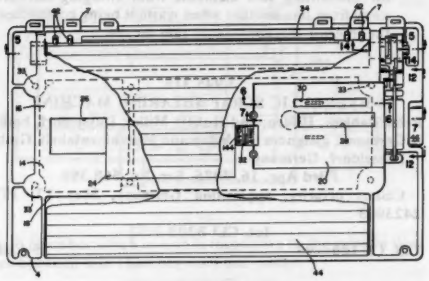
1. A portable transaction log recorder apparatus for use with an embossed credit card for applying data simultaneously both to a sales ticket and to a segment of a continuous form log sheet, comprising: an outer housing including a card receiving station and a card imprinting station;

credit card tray means slidably secured in said housing for sequentially receiving a credit card at said card receiving station, transferring and retaining said credit card at said imprinting station, and returning said card to said receiving station;

means in said housing adapted to support a continuous form log sheet;

means operatively connected to said sheet support means and adapted for indexing a segment of said log sheet incrementally past said imprinting station and including

interlock means for enabling retaining said credit card at said imprinting station only after actuation of said indexing means;



means on said housing adapted for receiving and supporting a sales ticket at said imprinting station in overlying relation to said log sheet supporting means; and

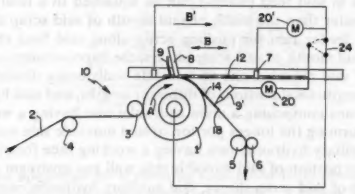
at least one imprinter wheel contained within said housing at said imprinting station.

3,945,317

WEB REGISTRATION SYSTEM USING RETROGRADE WEB MOVEMENT

Umberto Brasa, Uguccione da Pisa, No. 6, Milan, Milan Province, Italy

Filed June 28, 1973, Ser. No. 374,757
Claims priority, application Italy, June 28, 1972, 26345/72
Int. Cl.² B41F *15/24*
U.S. Cl. 101—124 **5 Claims**



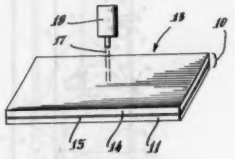
1. Means for automatically registering a paper web on a printing cylinder of a silk screen serigraphic printing machine comprising, means for feeding a web of sheet material to a printing cylinder for receiving a printed impression thereupon and with the web in contact with said cylinder at all times, indicia means carried by said web for indicating proper registration positioning for receipt of the next successive impression thereupon, first drive means including a first drive motor, for rotating said printing cylinder in one direction and thereby advancing said web to a position where said indicia means is located beyond the proper registration position, second drive means including a second drive motor, for rotating said printing cylinder in the opposite direction, retracting said web therewith, means for operatively disengaging said first drive means from said printing cylinder after each impression applied to said web is completed, means operatively engaging said second drive means with said printing cylinder for reversing said printing cylinder carrying the web therewith when said first drive means is disengaged therefrom, said first drive means remaining thus disengaged during operation of said second drive means, and scanning means for sensing said indicia when said web is retracted, said scanning means coupled to said second drive means for operatively disengaging same from said printing cylinder when said indicia reaches the proper registration position, said scanning means being located in monitoring position relative to said web and said indicia means.

3,945,318

PRINTING PLATE BLANK AND IMAGE SHEET BY LASER TRANSFER

Robert M. Landsman, Norwalk, Conn., assignor to LogEtronics, Inc., Springfield, Va.

Filed Apr. 8, 1974, Ser. No. 459,039
Int. Cl.² B41C *1/06, 1/10;* G01D *15/14*
U.S. Cl. 101—467 **13 Claims**



11. A printing plate blank comprising

receptor sheet means having a multiplicity of raised areas separated by troughs which will provide relief from excessive gas pressure generated therein during further processing of the blank,

a transfer sheet,

said transfer sheet comprising electrostatic means holding said transfer sheet to said multiplicity of raised areas while bridging said troughs so that the transfer sheet does not preclude the dispersion of gases to said troughs,

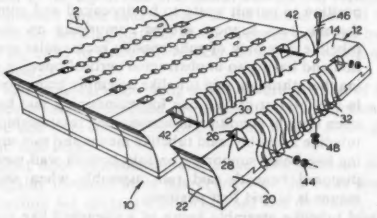
said transfer sheet comprising means which, in response to predetermined irradiation, releases gases between the first named means and the transfer sheet and also forms a printing plate by changing the character of the surface area of said first named means that is in contact with the portion of the transfer sheet which received the predetermined irradiation, whereby in response to selective application of said predetermined irradiation certain portions of the surface area of the first named means are changed in character to thereby form a printing plate.

3,945,319

BLASTING MAT

William Kevin Meagher, 2362 Islington Ave., Apt. 9, Rexdale, Ontario, Canada

Filed Oct. 24, 1974, Ser. No. 517,618
Int. Cl.² F42D *5/00*
U.S. Cl. 102—22 **10 Claims**



1. For use in assembling a blasting mat, an elongated section of slightly flexible material having an upper side and a lower side and a pair of parallel lateral sides, each lateral side being curved in a plane normal to the longitudinal axis of the section to form an overhanging upper portion along one of said lateral sides and an outwardly projecting lower portion along the other of said lateral sides, pressure relief port means in the

section, and means allowing the reception of interconnecting means for assembling a plurality of the sections in abutting relationship to form the mat.

3,945,320

WATER-RESISTANT FUSE-CORD

Andrew Gibson, Saltcoats, and Trevor John Turner, Ardrossan, both of Scotland, assignors to Imperial Chemical Industries Limited, London, England

Filed June 14, 1974, Ser. No. 479,524

Claims priority, application United Kingdom, July 4, 1973, 31769/73

Int. Cl.² C06C *5/04*

U.S. Cl. 102—27 R **27 Claims**

1. A dry-spun detonating fuse-cord comprising a core of dry particulate explosive material, supporting materials comprising at least one layer of textile material surrounding said core, and at least one water-gellable macromolecular material disposed around said core in contact with said textile material whereby, when the end of said fuse-cord is immersed in water, an aqueous gel of macromolecular material is formed which slows water migration through the textile layer.

3,945,321

SHELL AND METHOD OF MANUFACTURING THE SAME

Cornelius Mayer, Fällanden; Günther Diewald, and Heinrich Reber, both of Zurich, all of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

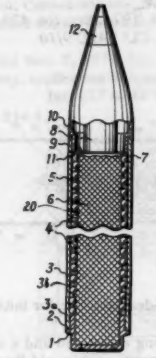
Filed Jan. 20, 1975, Ser. No. 542,433

Claims priority, application Switzerland, Feb. 13, 1974, 1985/74

Int. Cl.² F42B *13/48*

U.S. Cl. 102—67 **3 Claims**

1. A shell comprising a substantially cylindrical shell casing having an inner wall, an explosive mass disposed within the shell casing, substantially equal size, spherical-shaped projectiles bearing against said inner wall of the shell casing and partially embedded in the explosive mass, a filter mass disposed between the projectiles, said projectiles being partially embedded in said filler mass, the projectiles partially embedded in the filler mass being exposed to an axial pressure at the finished shell in order to prevent displacement and detachment of the projectiles from the shell casing and the thus resultant imbalance during firing of the shell.



3,945,322

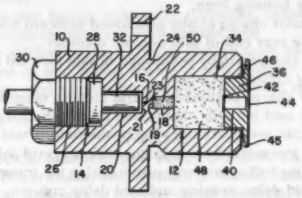
THROUGH-BULKHEAD EXPLOSION INITIATION

Bertil V. Carlson, Santa Cruz, and Donald C. Zapf, Ben Lomond, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 5, 1974, Ser. No. 458,252

Int. Cl.² F42B *19/08*

U.S. Cl. 102—70 R **14 Claims**



1. A through-bulkhead detonation device comprising:

a. a hermetic metallic barrier disposed in the housing of the device, said barrier having a first wall and a second wall,

b. a first chamber in the housing for the receipt of an explosive output-charge, located on one side of the barrier, said first chamber being defined on one end by the first wall of the barrier,

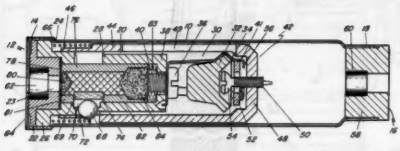
c. a second chamber in the housing for the receipt of an explosive detonating-cord which has an end segment, said second chamber being coaxial with and located on the opposite side of the barrier from the first chamber, said second chamber being defined on one end by the second wall of the barrier, said end segment having exterior dimensions slightly smaller than and congruent with the interior dimensions of said second chamber so as to enable said end segment to be placed proximate the barrier along the entire length of said end portion and forming a gap between the periphery of said end segment and said second chamber whereby said end segment initiates a shock wave which travels across said gap and across said barrier to detonate this output charge, aid device being distinguished by the absence of a donor charge between said end segment and said barrier.

3,945,323

IMPACT AND SELF-DESTRUCT FUZE

George T. Boswell, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 14, 1974, Ser. No. 479,404
Int. Cl.[2] F42C 9/10
U.S. Cl. 102—71 4 Claims



1. An impact and self-destruct fuze for initiating a grenade which comprises:

a tubular housing having a first end and a second end;

primer means fixedly positioned in said first end for initiating said fuze;

arming-firing means axially and fixedly positioned against said primer means and responsive thereto for placing said fuze in an armed condition during a first interval of time and for firing said fuze after a second interval of time which includes;

a delay housing axially aligned and positioned against said primer means, said delay housing having a transverse delay housing bore therein, a rear end and a forward end;

a flash disc positioned intermediate said primer means and said delay housing;

a hollow delay column member axially positioned in said delay housing, said column having a transverse delay column bore therein communicating with said transverse delay housing bore;

an initiator charge axially positioned adjacent said flash disc in the rear end of said column member;

a flash charge axially positioned in said forward end of said delay column member;

a delay charge positioned in said column member intermediate said initiator charge and said flash charge;

a eutectic metal arming plug positioned in said delay column transverse bore in juxtaposition to said delay charge;

an arming ball operatively positioned in the transverse bores of said delay housing and said delay column;

a self-destruct nut positioned within said forward end and adjacent said flash charge said nut being intermediate said delay column and said delay housing;

impact sensor means releasably connected to said arming-firing means for actuating said fuze in the event of an impact during said first interval of time; and before the end of said second interval of time

a screw threadedly connected to said self-destruct nut for releasably connecting said delay housing to said impact sensor means;

detonator means axially fixedly positioned in the second end of said tubular housing for exploding said grenade; and

biased striker means, mechanically restrained by said arming-firing means when said fuze is in a safe condition, said striker means being releasably held by said impact sensor means during said first interval of time and before the end of said second interval of time for initiating said detonator means upon impact of said fuze and after passage of said second interval of time;

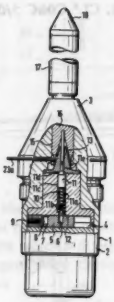
wherein said plug melts when heated by said delay charge releasing said arming ball so that it is not in interference with said striker means and places said fuze in said armed condition, and said self-destruct nut melts during said second interval of time releasing said striker means to impact said detonator means, thereby causing said fuze to self-destruct.

3,945,324

PROJECTILE FUSE

Jakhin Boas Popper, Kiryath Mozkin, and Avigdor Lowy, Haifa, both of Israel, assignors to The State of Israel Ministry of Defence Hakirya, Tel Aviv, Israel

Filed Feb. 4, 1971, Ser. No. 112,701
Claims priority, application Israel, Feb. 12, 1970, 33890
Int. Cl.[2] F42C 1/04
U.S. Cl. 102—78 6 Claims



1. A fuze assembly adapted to be attached to the nose of a spin-stabilized projectile comprising:

a. a fuze body having an axial aperture with which a detonator is adapted to be aligned when the fuze assembly is armed;

b. an extension rod aligned with the aperture and projecting axially forwardly from the body and having a base by which the rod is mounted on the body for limited axial movement;

c. striker pin means slidably mounted in the body aperture, and having a maximum cross-section smaller than the maximum cross-section of the base; and

d. spring means acting on the striker pin means for resiliently urging the latter in the forward direction into direct engagement with the base of the rod whereby an axial impulse in the rearward direction applied to the extension rod is transmitted by the base to the striker pin means causing the latter to move rearwardly independently of the rod and into engagement with the detonator when the firing assembly is armed.

3,945,325

RAILWAY BOGIE

Jurg Zehnder, Zurich, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation-in-part of Ser. No. 392,648, Aug. 29, 1973, which is a continuation of Ser. No. 149,924, June 4, 1971, abandoned. This application Sept. 16, 1974, Ser. No. 506,014
Claims priority, application Switzerland, Sept. 20, 1973, 13545/73
Int. Cl.[2] B61F 3/08, 5/06, 5/38, 5/52
U.S. Cl. 105—167 4 Claims

1. A railway vehicle bogie comprising

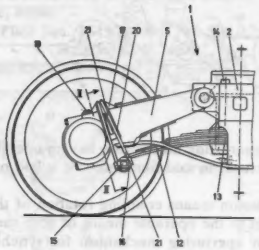
a main transverse beam and

two axles each carrying a pair of wheels,

each axle being linked to the beam by two radius arms, one on each side of the bogie,

each radius arm being pivoted to the respective axle and to the beam in a manner permitting vertical and lateral swinging of each arm relative to the beam and including cable holding means secured thereo, and

a leaf spring at each side of the bogie, each leaf spring being fixed at its center to the transverse beam and having each of its two ends linked to a respective radius arm by a respective unit,



each unit comprising a flexible, unextendable cable which is secured to the radius arm and to the leaf spring,

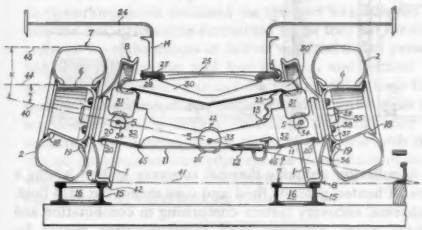
said cable holding means engaging the cable.

3,945,326

RAILWAY VEHICLE

Arthur Seifert, Box 41, Sound View Station, New York, N.Y. 10472

Filed Jan. 22, 1975, Ser. No. 542,960
Int. Cl.² B61F *13/00*
U.S. Cl. 105—215 C **8 Claims**



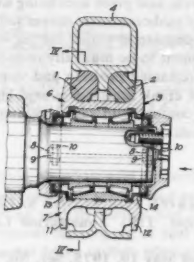
1. In a vehicle adapted to travel on rail or highway, a running gear composed of two transverse wheel axles, first means movably connecting the inner ends of said wheel axles together, a first pair of rail wheels mounted on the outer ends of said axles, a second pair of tire wheels mounted on the outer ends of said axles, said first connecting means having a lowered position in which one of said pairs of wheels are rendered operable and the other pair inoperative, and having a raised position in which said one pair of wheels are rendered inoperative and said other pair operative, second means movably connecting said wheel axles to the vehicle, and means operable to raise said first connecting means and to move said shafts about said second connecting means to bring one of said pairs of wheels into operative position, and operable to lower said first connecting means and to move said shafts about said second connecting means to bring the other of said pairs of wheels into operative position.

3,945,327

SUSPENSION DEVICE FOR SIDE MEMBERS ON AXLE-BOXES FOR RAILWAY CARRIAGES OR SIMILAR APPLIANCES

Paul E. Henricot, Ceroux-Mousty, Belgium, assignor to Societe Anonyme Usines Emile Henricot, Court-Saint-Etienne, Belgium

Filed Nov. 5, 1974, Ser. No. 521,076
Claims priority, application Belgium, Jan. 10, 1974, 809587
Int. Cl.² B61F *5/26*
U.S. Cl. 105—224.1 **1 Claim**



1. A suspension device for a railway carriage having a side frame and a generally cylindrical axle box, comprising:

said side frame having a circular portion spaced from and surrounding said axle box and provided with an inwardly extending circumferential central rim and inwardly facing circumferential recesses on opposite sides of said rim;

said axle box having axially spaced circumferential shoulders;

an adaptor comprising semi-cylindrical portions, releasably secured together, surrounding said axle box and having inner peripheral ledge portions engaging said shoulders to prevent axial displacement of said adapter relative to said axle box;

said adaptor having outwardly extending circumferential rims adjacent the axial ends thereof; and

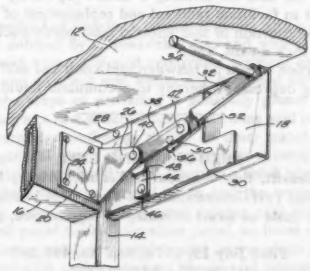
circular rubber beads, between said adaptor and circular portion of said frame, seated in said recesses and being held on said adaptor by said circumferential rims.

3,945,328

HINGE LOCK MECHANISM FOR FOLDING TABLE LEG

Philip J. Hendrickson, and Richard J. Resch, both of Green Bay, Wis., assignors to Krueger Metal Products, Inc., Green Bay, Wis.

Filed Nov. 13, 1974, Ser. No. 523,384
Int. Cl.² A47B *3/08*
U.S. Cl. 108—132 **11 Claims**



2. A hinge lock mechanism for a folding table leg which is pivotable between an extended position perpendicular to the top of said table and a retracted position parallel to the top of said table, said hinge lock mechanism comprising a support arm rigidly attached to said leg near the top thereof and ex-

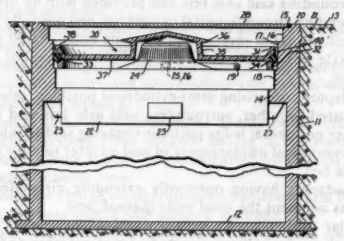
tending inwardly therefrom, a support plate rigidly attached to the bottom of said table near said leg and extending downwardly therefrom adjacent to said support arm, an abutment attached to the bottom of said table top near said leg, a crank arm pivotally attached to said support plate about a first pivot axis, a first link pivotally attached at one end to the inner end of said support arm about a second pivot axis and pivotally attached at the other end of said crank arm about a third pivot axis, and a second link pivotally attached at one end to said support arm and said first link about said second pivot axis and pivotally attached at the other end to said support plate about a fourth pivot axis, said pivot axes being so located that downward rotation of said crank arm moves said leg away from said abutment to a position in which the leg is sufficiently spaced from said abutment to be manually rotated from its extended position to its retracted position and vice versa, and upward rotation of said crank arm moves said leg toward said abutment and into contact with said abutment when the leg is in its extended position.

3,945,329

WATER BARRIER FOR FLOOR SAFES OR THE LIKE

Alan W. Bywater, 1181 Aquamarine Lane, Corona, Calif. 91720

Filed May 19, 1975, Ser. No. 578,519
Int. Cl.² E05G 1/026
U.S. Cl. 109—68 **10 Claims**



1. A liquid barrier for a floor safe or the like having
a cylindrical case,
a lockable door removably mounted in the said case,
said door having a lock means thereon,
comprising
a removable lid fitted in said case above said door,
said lid having an elastomeric sealing ring around the periphery thereof and extending in sealing engagement with the inner surface of said case, and
means on said lid forming a hollow upwardly extending knob to facilitate removal and replacement of said lid,
the underportion of said knob at least partly encompassing said lock means, and
the portion of said lid between said knob and said periphery being depressed whereby to accumulate liquid.

3,945,330

SEED PLANTING UNIT

Chaim Leavitt, Sde' Varbourg; Yekutiel Alper, Rishon Le Zion, and Tzvi Gruenewald, Bat-Yam, all of Israel, assignors to The State of Israel Ministry of Agriculture, Jerusalem, Israel

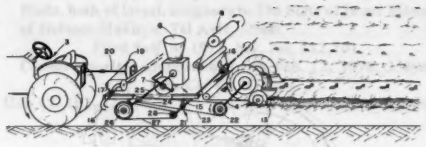
Filed July 25, 1974, Ser. No. 491,662
Int. Cl.² A01C 11/00
U.S. Cl. 111—1 **6 Claims**

1. A seed planting unit comprising:

a. a support structure carrying a ground engaging wheel that rotates in response to displacement of the structure on the ground;

b. a seed planter carried by said structure and having operable means for depositing seeds in the ground;

c. film dispenser means carried by said structure downstream of the seed planter for dispensing film and laying it on the ground over the seeds deposited by the seed planter as said structure is displaced;



d. a film aperturing mechanism having operable means for making apertures in said film before it is laid on the ground; and

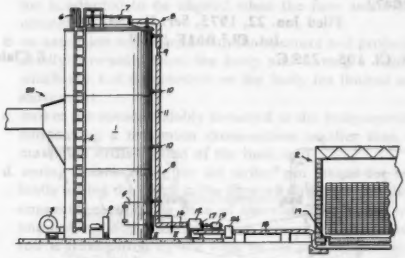
e. transmission means coupling rotation of the groung engeging wheel to the operable means of both the seed planter and the film aperturing mechanism for synchronizing their operation such that the apertures in the film laid on the ground by the film dispenser are aligned with the seeds deposited in the ground by the seed planter.

3,945,331

THERMAL RECOVERY SYSTEM

Dale E. Drake, Concrete, and Jerry J. Nelson, Sedro Woolley, both of Wash., assignors to Enertherm, Inc., Mount Vernon, Wash.

Filed Jan. 23, 1975, Ser. No. 543,491
Int. Cl.² F23G 7/00
U.S. Cl. 110—7 R **12 Claims**



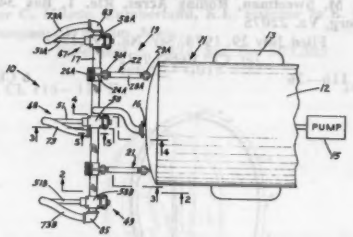
1. A pollution reducing-thermal recovery system having a source of heated gaseous fluid and user means for said fluid, said thermal recovery system comprising in combination and in stated order; recovery fluid communication means for communicating said user means directly with said source of heated gaseous fluid, ambient fluid communication means connected with said recovery fluid communication means at a point of confluence, said ambient fluid communication means connected with said recovery fluid communication means downstream of said source for communicating ambient fluid to said recovery fluid communication means at said point of confluence, automatic valve means for automatically controlling the flow of said ambient fluid through said ambient fluid communication means in response to a system load condition of said user means, primary mixing means disposed downstream of said point of confluence and upstream of said user means for mixing said ambient fluid from said ambient fluid communication means and said heated gaseous fluid from said recovery fluid communication means, pump means having inlet means and outlet means, said inlet means being in direct communication with said primary mixing means for pumping mixed ambient and heated gaseous fluids from said primary mixing means to said outlet means, mixed fluid com-

munication means connected with said outlet means for directly communicating said mixed ambient and heated gaseous fluids to said user means.

3,945,332
APPARATUS FOR INJECTING MATERIAL INTO THE SOIL

James L. Wirsbinski, Long Lake, Minn., assignor to Veda, Inc., Long Lake, Minn.

Filed Jan. 2, 1975, Ser. No. 538,175
Int. Cl.² A01C 23/02
U.S. Cl. 111—7 **17 Claims**



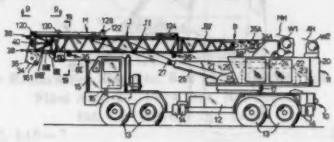
1. An apparatus for dispensing material below the surface of the soil usable with a machine having a tank for carrying the material, a frame secured to the tank, said frame having rear portions located adjacent the rear of the tank, wheel means mounted on the frame for supporting the machine on the ground, and means to deliver material under pressure from the tank to the apparatus comprising: a tool bar having a longitudinal passage for carrying material, means connecting the tool bar to the rear portions of the frame and locating the tool bar transversely adjacent the rear of the tank, and means connecting the tool bar to the frame operable to selectively raise and lower the tool bar, fluid power means connected to the frame, means for connecting the tool bar passage to the means to deliver material under pressure to the apparatus, a plurality of earthworking tools mounted on the tool bar adapted to dig into the soil, first means connected to the tool bar for carrying material from the means to deliver material under pressure to the apparatus to the tool bar passage, and second means connected to the tool bar and the earthworking tools to carry material from the tool bar passage, said second means including nozzles having bottom discharge openings and means mounting the nozzles on the back of the tools with the discharge openings located adjacent the lower ends of the tools whereby the material is discharged below the surface of the soil behind the earthworking tools.

3,945,333
MEANS FOR STORING AND CONNECTING JIB FOR TELESCOPIC BOOM OF MOBILE CRANE

Robert A. Fritsch; James C. Mayo, Sr., and James N. Johnson, all of Cedar Rapids, Iowa, assignors to Harnischfeger Corporation, West Milwaukee, Wis.

Filed Dec. 20, 1974, Ser. No. 534,747
Int. Cl.² B66C 23/62
U.S. Cl. 212—144 **16 Claims**

1. In a mobile crane: a multisection telescopic boom including a boom fly section, an adjacent boom into which said fly section can telescope, and selectively operable means for moving said fly section relative to said adjacent boom section, said fly section having a point end; a jib for optional use with said boom, said jib having a base end and a point end; jib storage means near a side of said boom for storing said jib alongside said boom with said base end of said jib near said point end of said fly section; hinge means on said fly section and on said jib for pivotally connecting said base end of said jib to said point end of said fly section whereby said jib can be swung off said jib storage means and into alignment with said boom; connection means for securing said jib to said fly section when said jib is swung into alignment with said boom; a mast pivotally connected to said jib and swingable between a stored position alongside said jib and an upright position; at least one forward guy line connected between said mast and said jib; at least one rear guy line connected between said mast and said adjacent boom section; said rear guy line effecting erection of said mast to upright position wherein said forward

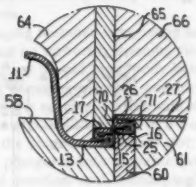


guy line supports said jib when said fly section is extended relative to said adjacent boom section and selectively releasable locking means on said fly section and on said adjacent boom section to prevent telescoping of said fly section with respect to said adjacent boom section when said fly section is extended, said releasable locking means comprising abutment means on said fly section near said point end of said fly section and a locking assembly on said adjacent boom section, said locking assembly comprising a selectively movable spring-biased locking member.

3,945,334
METHOD OF AND APPARATUS FOR FORMING FOLDS IN A CONTAINER PANEL

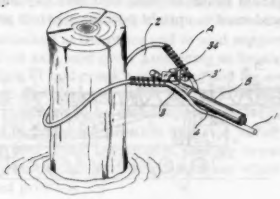
Obert M. Ostrem, Westmont, and Donald F. Kulikowski, Oak Forest, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed July 23, 1974, Ser. No. 490,983
Int. Cl.² B21D 51/26
U.S. Cl. 113—121 C **20 Claims**



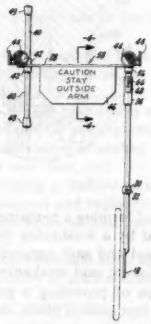
1. A method of forming a container panel with a removable segment defined by a weakening line and with a protective fold in said panel and said removable segment on opposite sides of and adjacent said weakening line, said method comprising the steps of providing a generally planar container panel lying in a first general plane, deforming said panel about a predetermined outline to define an inner panel lying in a second general plane offset from the first general plane, an intermediate peripheral panel lying in a third general plane intermediate the first general plane and the second general plane, an outer upstanding panel joining said intermediate peripheral panel to said container panel, an inner upstanding panel joining said inner panel to said intermediate peripheral panel, and with said weakening line in said intermediate peripheral panel; and then moving said intermediate peripheral panel and said inner panel towards the general plane of said container panel with said inner and outer upstanding panels being sequentially folded to positions at small angles to said general plane of said container panel.

3,945,335
BOAT DOCKING DEVICE
David W. Kratz, 17 Country Life Acres, St. Louis County, Mo. 63131
Filed Dec. 13, 1974, Ser. No. 532,394
Int. Cl.² B63B 21/04
U.S. Cl. 114—221 R 14 Claims



1. The combination of a flexible boat line having a loop formed in one end portion thereof encirclable about a mooring device, said loop having a base portion with opposing strands progressing therefrom, and of a docking device comprising a pair of rigid arms in correspondence to said strands, each arm having outer and inner ends, the outer ends of said arms terminating spacedly inwardly of the bight portion of said loop, means securing each of said arms rigidly on the related line strand, said securing means inhibiting relative movement of said arms with respect to the engaged strands so that the same at all times act unitarily, said arms having their inner ends relatively proximate said loop base portion, and means pivotally interengaging said arms at their inner end portions premitting swinging of the same together with the engaged portions of said strands away from each other for opening of said loop.

3,945,336
BICYCLE DISTANCE SAFETY DEVICE
Willie Harris, 1519 89th Ave., Oakland, Calif. 94621
Filed Jan. 22, 1975, Ser. No. 543,041
Int. Cl.² B62J 5/00, 27/00
U.S. Cl. 116—28 R 5 Claims

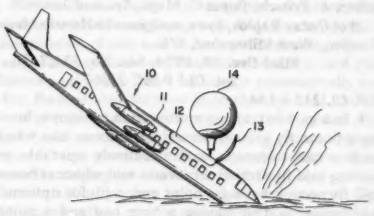


1. A bicycle distance safety device attachable to bicycles for indicating a minimum safe distance to be maintained from inexperienced bicycle riders, comprising: an elongated vertical member having a top end and bottom end, said bottom end having an aperture therethrough and including means for attaching said vertical member to the rear portion of a bicycle frame with said top end extending substantially above the bicycle; over end of an arm member connected between the ends of said vertical member and the other end thereof connected to the bicycle; a cross member having a base end and distal end, said base end having means for attaching said cross member to the top end of said vertical member with said distal end horizontally extending outwardly from the side of said bicycle a predetermined distance indicating a minimum safe distance to be maintained from the bicycle; and, indicator means on the distal end of said cross member for indicating the recommended minimum distance to be maintained in passing a bicycle equipped with said safety device, said safety device being fabricated predominantly of a lightweight material to minimize interference of said safety device with the balance of the bicycle to which it is attached.

3,945,337
SAFETY ARCH
Dorothy M. Sweetman, Rolling Acres, Rte. 1, Box 347-B, Leesburg, Va. 22075
Filed July 29, 1974, Ser. No. 492,475
Int. Cl.² B60Q 1/32
U.S. Cl. 116—36 6 Claims

1. A reflective safety-signal device for the front of a vehicle of the type adapted to have a rider seated thereon and having handlebars, comprising a reflective member of inverted, substantially U-shaped form, having a width approximately that of said handlebars, and a height greater than said rider's head when said rider is seated on said vehicle, and means to attach said member on the front of said vehicle, whereby said signal is easily apparent to approaching drivers, apprising them of the presence, position and width of said vehicle.

3,945,338
LOCATION INDICATOR FOR LOST AIRCRAFT
Affonso Henriques Correa, 3040 Idaho Ave., N.W., Apt. 316, Washington, D.C. 20016
Filed Nov. 13, 1974, Ser. No. 523,540
Int. Cl.² G09F 9/00
U.S. Cl. 116—124 B 4 Claims



1. A location indicator for lost aircraft comprising omnidirectional crash sensor means, means comprising an automobile air cushion inflator for generating a charge of lighter-

than-air gas in response to said crash sensor means, said inflator comprises a small cylinder of stored gas and a solid propellant which produces a large amount of gas upon burning, an inflatable balloon having a check valve in the mouth thereof releaseably attached to said gas generating means in the deflated condition to receive said charge of gas so as to become inflated and buoyant in less than 1 second, and a reeled line connecting the balloon to the aircraft so that the balloon is maintained in spaced relation to the aircraft.

3,945,339
DIAL INDICATORS WITH INTERCHANGEABLE MOVEMENT

Roger C. Milette, Cumberland, R.I., assignor to B. C. Ames Company, Waltham, Mass.

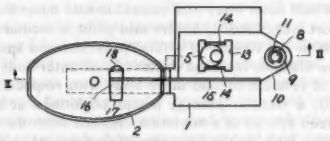
Filed Sept. 5, 1974, Ser. No. 503,385
Int. Cl.² G01B *3/22*
U.S. Cl. 116—129 F **14 Claims**

1. A dial indicator, comprising
a. a generally cylindrical casing formed with an internal cavity and at least one opening in the walls thereof,
b. a gear train sub-assembly mountable to said casing through said opening,
c. said sub-assembly including a substantially flat circular plate continuous to said casing and a gear movement mounted to one face only of said plate,
d. means mounting said plate to said casing across said opening with said movement disposed within said cavity,
e. a graduated circular dial having a diameter substantially equal to the diameter of said casing mounted to the other face of said plate,
f. an indicator needle rotatably mounted to said other face and in driving engagement with said gear movement, and
g. a spindle formed with rack teeth mounted in said casing for reciprocating motion relative thereto and in driving engagement with said gear train, said spindle having at least one end thereof projecting through said casing.

3,945,340
DEVICE FOR STRIKING A BELL

Takeshi Yanagisawa, Chiba, Japan, assignor to Kabushiki Kaisha Seikosha, Japan

Filed Nov. 18, 1974, Ser. No. 524,936
Claims priority, application Japan, Nov. 21, 1973, 48-134613[U]; Dec. 14, 1973, 48-139874[U]
Int. Cl.² G10K *1/065*
U.S. Cl. 116—157 **8 Claims**

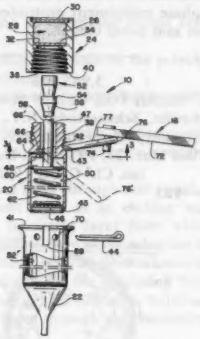


1. Device for striking a bell comprising:
a base plate,
a rockable striking hammer lever rockably mounted on said base plate,
driving means for driving said striking hammer lever with a rocking motion including a motor and an eccentric cam secured to a driving shaft of said motor,
a hammer head connected to the end portion of said striking hammer lever, and
a bell positioned relative to said hammer head to be struck by said hammer head during rocking motion of said striking hammer lever.

3,945,341
DYE GUN MARKER

George R. Jackson, Star Rte. Box 127, Midkiff, Tex. 79755

Filed Aug. 27, 1974, Ser. No. 500,851
Int. Cl.² B05C *5/00, 11/00*
U.S. Cl. 118—7 **3 Claims**



1. A marker device for ejecting chemical marking substance onto nearby objects comprising:
a main body having a chamber means formed therein for containing an isolated quantity of chemical marking substance therein;
a ground engaging member comprising an outwardly flared tubing having an upwardly opening slot formed therein;
a marginal portion of said main body being received within said ground engaging member and having a pin located thereon which is received within said slot, a spring member received about said tubing in a position to bias said pin toward the closed end of said slot;
an evacuating plunger means movable from a retracted into an extended position and telescopingly received within said chamber when moved into the extended position;
a power mechanism which can be actuated to move the plunger along its longitudinal axis;
a trigger mechanism for actuating said power mechanism;
and means for remotely actuating the trigger in response to movement of an object into contact therewith.

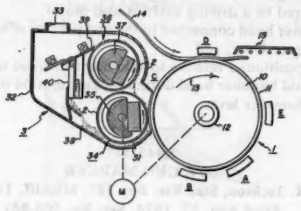
3,945,342
MAGNETIC BRUSH SUPPORT MEMBER

Arthur Drummond, Jr., Walworth, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 414,015, Nov. 8, 1973, Pat. No. 3,893,815.
This application Jan. 29, 1975, Ser. No. 544,977
Int. Cl.² G03G *15/08*
U.S. Cl. 118—637 **7 Claims**

1. A magnetic brush apparatus including:
at least one magnetic brush support member having a surface adapted to support a magnetic brush including magnetic particles and means cooperating with said support member for providing a magnetic field for forming said brush, the improvement wherein; said magnetic brush

support member is formed of a composite comprising a metal binder component and a particulate second phase component wherein: said second phase component is



formed of a material which has a greater abrasion resistance than said metal binder and wherein a portion of said second phase component protrudes at said support surface from said metal binder.

3,945,343

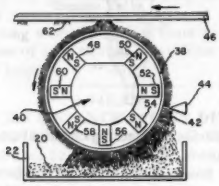
MAGNETIC BRUSH FOR USE IN MAGNETIC PRINTING

Ami E. Berkowitz, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 24, 1975, Ser. No. 561,668

Int. Cl.² G03G *19/00*

U.S. Cl. 118—623 **8 Claims**



1. An improved machine, adapted for applying and removing particulate, ferromagnetic toner onto a surface of a magnetic recording medium, of the type comprising a multi-pole stator of generally prismatic shape; a hollow applicator cylinder rotatably disposed around the stator; and means for exciting the poles of the stator with magnetic fields; wherein, as an improvement:

said stator comprises a plurality of poles radially disposed about the axis of said cylinder;

said plurality of poles comprises two principal poles, said principal poles being disposed closer to said surface of said recording medium than the remainder of said plurality of poles;

said means adapted for exciting said principal poles with magnetic fields having like orientation.

3,945,344

BIRD FEEDER

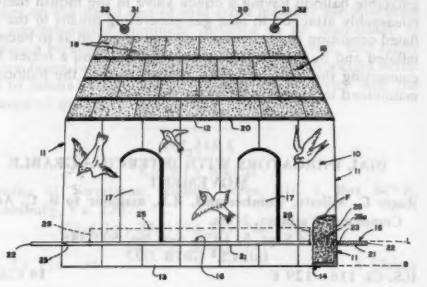
Richard L. Melrath, 946 Longview Road, King of Prussia, Pa. 19406

Filed Sept. 5, 1974, Ser. No. 503,258

Int. Cl.² A01K *39/00*

U.S. Cl. 119—51 R **11 Claims**

1. A bird feeder comprising a flat floor having a plurality of sides, a corresponding plurality of walls of stiff sheeting material which are inclined inwardly toward the top, said walls forming the walls of a house and being secured at their bases to the respective sides of said floor, said walls at a predetermined distance above said floor having respective integral roof portions foldably inclined inwardly and upwardly and interengageable for forming a roof, to form an enclosure in which bird feed is contained, a piece of thin, rigid material



forming a bird platform surrounding said walls at a level above the bottom of said walls, and means for providing feed to the outside of the enclosure.

3,945,345

ROTARY INTERNAL COMBUSTION ENGINE AND A METHOD OF OPERATING THE SAME

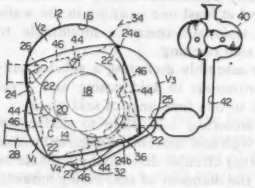
Yoshikazu Ishikawa, Chofu, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Apr. 17, 1974, Ser. No. 461,802

Claims priority, application Japan, Apr. 17, 1973, 48-42664

Int. Cl.² F02B *53/06*

U.S. Cl. 123—8.05 **2 Claims**



1. In a seven phase rotary internal combustion engine comprising an outer stationary body; an inner body, said inner body being rotatable with respect to said outer body; said outer body including axially spaced end walls and a peripheral wall interconnecting the end walls, said peripheral wall including on the inner surface thereof three symmetrically arranged circumferentially spaced lobedefining portions, said inner body having its geometric center eccentrically displaced relative to the geometric center of said outer body and including on the outer peripheral surface thereof four symmetrically arranged circumferentially spaced apex portions, said inner surface of said peripheral wall and said outer peripheral surface being cooperatively shaped and operatively associated to define upon relative rotation of said inner body with respect to said outer body four variable volume working chambers; a first intake port means operatively associated with said outer body shortly beyond a point thereon spaced at a minimum distance from the center of said outer body in the direction of rotation of said inner body with respect to said outer body; an exhaust port means shortly before said point; a second intake port means in the vicinity of a third point thereon spaced at a minimum distance from the center of said outer body in the direction of rotation of said inner body with respect to said outer body; a transfer passage means positioned at a third point thereon spaced at a minimum distance from the center of said outer body in the direction of rotation of said inner body with respect to said outer body for placing one chamber of the engine into fluid communication with a second chamber

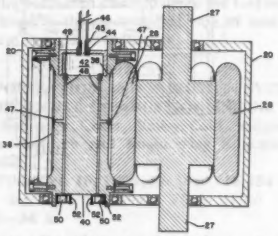
which is next preceding in said direction of rotation once during each operational cycle of each chamber to transfer a portion of expanding combusting fuel-air mixture from said one chamber to said second chamber and for placing said one chamber in communication with a third chamber which is next following in said direction of rotation once during each operational cycle of each chamber to transfer the combustion product from said third chamber to said one chamber, a source of scavenging air communicating with said second intake port means; and ignition means operatively associated with said outer body and arranged to successively communicate with each chamber, said ignition means being positioned shortly before a second point thereon spaced at a minimum distance from the center of said outer body in the direction of rotation of said inner body with respect to said outer body; the improvement in which said second intake port means is disposed in an area of one of said end walls that is continuously covered by said inner body, said inner body having four mating ports in one end face adjacent to said one end wall and four passages therein establishing communication between said mating ports and the adjacent chambers, respectively, each of said mating ports being so disposed in said end face that it communicates with said second intake port once during each operational cycle of one of said adjacent chambers.

3,945,346

ROTARY DIESEL ENGINE

Phillip S. Daniels, Jr., 5231 Seven Hills Road, Pfafftown, N.C. 27040

Filed Mar. 10, 1975, Ser. No. 556,631
Int. Cl.² F02B *55/14*
U.S. Cl. 123—8.47 **15 Claims**



1. A rotary diesel engine comprising: a casing providing a working space forming at least two intersecting cylindrical chambers; a rotor rotatably positioned in at least one of said chambers having a plurality of radially extending and alternating lobes and interspaces; a rotary sealing member positioned in at least one of the other of said chambers having a plurality of radially extending and alternating grooves and dividers intermeshing with the lobes and interspaces of said rotor, each groove having a substantially centered longitudinally extending recess therein; a fuel injection assembly cooperatively carried by said rotary sealing member having a manifold, a fuel entry port connecting with said manifold, means controlling the quantity of fuel introduced through said entry port, a plurality of fuel injection chambers communicating with said manifold and said substantially centered recess, pressure building means proximate each of said fuel injection chambers operable to force fuel under pressure into said substantially centered recess for combustion, and means selectively actuating said pressure building means and said fuel quantity controlling means; and exhaust means associated with said intersecting cylindrical chambers.

3,945,347

METHOD OF MAKING INTEGRATED CIRCUITS

Toyoki Takemoto, Kyoto, and Hiroshi Kuroda, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 16, 1973, Ser. No. 406,927
Claims priority, application Japan, Oct. 16, 1972, 47-104283
Int. Cl.² B01J *17/00*
U.S. Cl. 29—577 **7 Claims**

1. Method of making an integrated circuit comprising the steps of:

forming impurity diffused regions on the principal face of a semiconductor substrate,

coating the principal face of said substrate with an insulating layer,

coating said insulating layer with a photoresist layer of a specified pattern having openings on specified positions thereon,

etching said insulating layer through said openings by utilizing said photoresist layer as an etching mask to form openings in said insulating layer from which specified regions of said principal face of the substrate are exposed,

vapor depositing a metal layer of the thickness substantially equal to the thickness of the insulating layer over the entire principal face of said substrate, to fill said openings in the insulating layer through said insulating layer and said photoresist layer,

applying a photoresist removing liquid to remove said photoresist layer and the part of said metal layer that is remaining on said photoresist layer while leaving only said metal layer in said openings at a level flush with the upper surface of said insulating layer, and

forming on said insulating layer metal strips having widths substantially corresponding to said openings and overlying said openings to thereby contact said metal layer formed in said openings and embed the metal layer in the openings between said specified regions of the substrate and said metal strips.

3,945,348

TWO-CHAMBER, TWO-STROKE ROCKING PISTON INTERNAL COMBUSTION ENGINE

Robert Balve, Tilsiterstrasse 19, 6641 Hilbringen, Seltert, Germany

Filed Oct. 16, 1973, Ser. No. 406,975
Claims priority, application Luxemburg, Oct. 16, 1973, 66303
Int. Cl.² F02B *53/06, 53/10*
U.S. Cl. 123—18 R **7 Claims**

1. A two-chamber, two-stroke rocking piston internal combustion engine comprising:

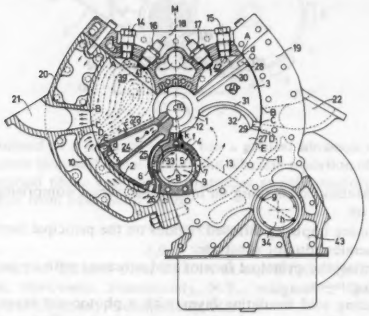
a. a housing having a cavity therein;

b. two rocking pistons directly mounted on a common shaft in said housing cavity, each of said rocking pistons having a forward side delimiting a work chamber and a back side delimiting a pump chamber, each of said pistons being movable through a work stroke and a compression stroke, precompression of fresh air taking place in said pump chamber as each piston moves through its work stroke;

c. a hollow, cylindrical, stationary separation element located between the two pump chambers, said separation element having control slots therein;

d. a hollow, rotatable slide mounted in said separation element and having an internal fresh air intake channel and a through flow slot for cooperation with said control slots in the separation element to positively control admission of fresh air into the two pump chambers and also positively control precompression thereof in said two pump chambers;

e. by-pass channels formed in said housing and extending between each pump chamber and the associated work chamber;



f. means connecting each by-pass channel for communication with one pump chamber and the associated work chamber so as to permit scavenging and recharging of such work chamber by precompressed fresh air from the pump chamber when the piston delimiting such chambers reaches a position wherein there is fluid flow communication between such pump chamber and the work chamber;

g. means, coupled with the engine, for supplying fuel thereto; and

h. ignition means associated with each work chamber.

3,945,349

AIR CONVEYING SYSTEM, ESPECIALLY IN THE INTAKE LINE, FOR SUCCESSIVE CYLINDERS OF RECIPROCABLE PISTON INTERNAL COMBUSTION ENGINES

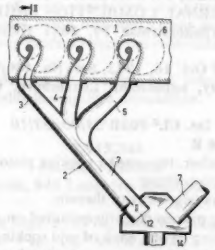
Ludwig Elsbett, and Gunter Elsbett, both of Industriestrasse 14, D 8543 Hilpoltstein, Germany

Filed Aug. 30, 1973, Ser. No. 392,869

Claims priority, application Germany, Sept. 2, 1972, 2243269

Int. Cl.² F02B *75/18, 3/00*

U.S. Cl. 123—30 C **2 Claims**



1. An air intake system for a reciprocable piston internal combustion engine having at least one group of cylinders with valve seats opening into the respective cylinders, said system including a conduit having an air inlet end, a plurality of tap lines opening from the other end and connected to the cylinders of said group and opening into the respective valve seat openings, the end of each tap line opening into said conduit having a diameter substantially equal to the diameter of the conduit at that end, each of said tap lines having a curved end connecting to its respective valve seat opening as a twist forming means arranged adjacent the respective valve seat opening for imparting a twist to the air passing through said valve seat opening, the cross section of said conduit and the said tap lines opening therefrom decreasing gradually in a continuous manner from the inlet end of said conduit to the opening for each tap line and continuing such gradually decreasing area to the respective valve seat opening of each tap line, the distance from the inlet end of said conduit to the end of each tap line opening into its respective valve seat opening being substantially equal, so that on each inlet stroke of each piston, the same volume of air is delivered to the cylinder and the decreasing area of said conduit and each tap line increases the velocity of the air passing from said inlet end of said conduit to said twist forming means and the respective valve opening.

3,945,350

FUEL INJECTION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

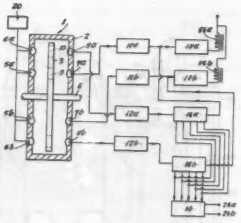
Eric Harold Ford, London, England, assignor to Lumenition Limited, England

Division of Ser. No. 321,660, Jan. 8, 1973. This application Jan. 30, 1974, Ser. No. 438,178

Claims priority, application United Kingdom, Jan. 18, 1972, 2311/72

Int. Cl.² F02B *3/00*

U.S. Cl. 123—32 EA **11 Claims**

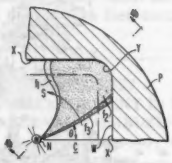


1. An electronic device for controlling the quantity of fuel injected in a fuel injection system of an internal combustion engine in accordance with engine requirements, including means for generating a first series of square-wave voltage pulses in synchronism with the engine revolutions to provide a series of alternate first and second voltage levels; means for generating a second sereies of square-wave voltage pulses also in synchronism with the engine revolutions and at a fixed multiple of the first series of square-wave voltage pulses, so that the frequency of the second series of voltage pulses is greatly in excess of the frequency of the first series of voltage pulses; means for counting a number of the second series of voltage pulses from a predetermined point in relation to the first series of voltage pulses, the numbeer of said pulses counted depending on the engine requirements; means for producing an output at the first voltage level from said counting means after said count has been completed; means for detecting the presence of both an output at the first voltage level from the first pulse generating means, and an output at the first level from the counting means, in order to inject a quantity of fuel dependent on the remainder of the count for which there is an output at the first level from the first series of voltage pulses; and means for continuously varying the count of the counting means in accordance with the requirements of the engine.

3,945,351
COMBUSTION CHAMBER OF A DIRECT FUEL INJECTION TYPE DIESEL ENGINE

Motoyasu Kimbara, Yokohama, and Hiroshi Shimomukai, Fujisawa, both of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed July 19, 1974, Ser. No. 489,975
Int. Cl.² F02B *23/06*
U.S. Cl. 123—32 B **2 Claims**

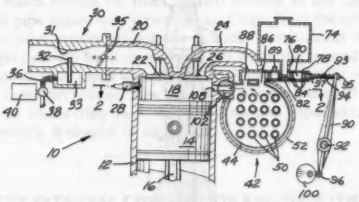


1. In a combustion chamber of a direct fuel injection type diesel engine, wherein a cavity is formed at the crown of a piston, means are provided for generating a fuel mixture swirl in the cavity, and a multi orifice fuel injection nozzle is centered with respect to the cavity; the improvement characterized in that: the cavity is defined by a bottom wall and an inner side wall means, said side wall means comprising a number of flat wall and circular wall portions and being of polygonal shape in perpendicular section to the vertical axis of the piston throughout the vertical extent of said cavity, said fuel injection nozzle has a number of orifices corresponding to the number of flat wall portions, and the cavity inner side wall means is inclined inwardly and upwardly relative to the piston axis, and the nozzle openings being such that the multiple injection fuel jets are directed obliquely toward respectively side wall flat portions in the horizontal plane to cause the fuel mixture to be distributed towards the downstream side of said swirl after impinging said inner side wall means.

3,945,352
FUEL VAPORIZATION AND INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Christian J. Reimuller, Cherry Valley, Calif., assignor to Foundation for Research and Engineering Education, Cherry Valley, Calif.

Filed Oct. 16, 1974, Ser. No. 515,154
Int. Cl.² F02B *69/00*; F02M *31/00*
U.S. Cl. 123—34 A **1 Claim**



1. An internal combustion engine comprising, in combination:

a stationary housing having a movable power transmitting member cooperating therewith to define a variable displacement combustion chamber;

means for admitting fresh air into said combustion chamber, said fresh air being subsequently compressed within the combustion chamber by said movable power transmitting member;

means, comprising a boiler, external to said combustion chamber for adding the latent heat of vaporization and a component of superheat to liquid fuel, so as to convert the same into a superheated gaseous state under high pressure exceeding the pressure of said compressed air;

said boiler being connected to the exhaust of said engine so that the heat in the exhaust gas is utilized in vaporizing said liquid fuel;

said boiler also having a burner for generating additional heat when needed;

means for delivering liquid fuel to said boiler at approximately the same rate as the fuel is used by the engine;

valve means operable to discharge a metered amount of superheated fuel vapor into said combustion chamber near the peak of the compression stage, said valve means comprising a spool-type transfer pump for supplying liquid fuel to said boiler at approximately the same rate that it is consumed by the engine;

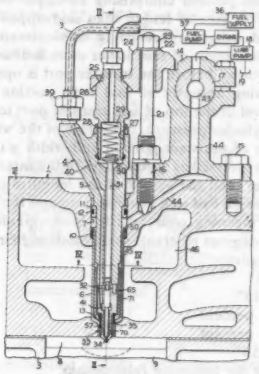
a passageway directly connecting said boiler to said combustion chamber; and

a valve rotatable and slidable longitudinally within said passageway to vary the orifice size when the valve is open, thereby regulating the amount of fuel vapor that is injected into the combustion chamber.

3,945,353
TWO PHASE NOZZLE COOLING SYSTEM

Alexander Dreisin, Olympia Fields, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 29, 1974, Ser. No. 528,345
Int. Cl.² F01P *9/02*
U.S. Cl. 123—41.22 **11 Claims**



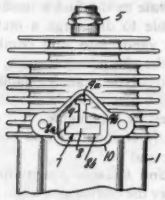
1. A two phase fuel injection nozzle cooling system comprising, an engine forming a combustion chamber, a nozzle including, a nozzle body mounted on said engine, a differential valve mounted on said nozzle body for injecting fuel in said combustion chamber, fuel inlet passage means in said nozzle body connected to said differential valve, said nozzle body defining cooling fluid passages, at least one heat pipe defining a cooling medium passage, means defining cooling medium passages surrounding the differential valve in communication with said cooling medium passage in said heat pipe adapted for receiving a cooling medium having a boiling point in the range of acceptable operating temperatures of the fuel injection nozzle, a hydraulic cooling fluid system including said cooling fluid passages in said nozzle body and surrounding a portion of said heat pipe for operating as a heat sink, means for circulating cooling fluid through said hydraulic system to thereby provide cooling of said nozzle.

3,945,354

EXHAUST PORT OF TWO CYCLE ENGINE

Mervyn B. Johnston, Greenwich, Conn., assignor to Textron Inc., Providence, R.I.

Filed Aug. 9, 1973, Ser. No. 386,890
Int. Cl.² F02B 25/14
U.S. Cl. 123—65 P 8 Claims



1. In a spark ignition two cycle internal combustion engine comprising a cylinder having a head, a crankshaft and a piston connected to said crankshaft and reciprocable in said cylinder, said cylinder having a single exhaust port and a transfer port successively uncovered by said piston to exhaust burned gasses from said cylinder and to admit a fresh charge of fuel-air mixture to said cylinder, the improvement that the exhaust port has the general shape of an inverted T with a wider base portion and a narrower stem portion extending upwardly toward the head of said cylinder, the bottom of said base portion being at bottom dead center of piston reciprocation, the top of said base portion being approximately at the level of the top of said transfer port and the top of said stem portion being from 20° to 55° in advance of the top of said transfer port, said stem portion comprising an upper section and a lower section of greater length than said upper section, the width of said exhaust port being approximately uniform throughout the length of said lower stem section to provide selected blowdown before the transfer port is opened and the width increasing abruptly at said base portion at approximately the level of the top of said transfer port to effect rapid lowering of cylinder pressure, the values of the width x of said upper section of the stem portion and width y of said lower section both expressed as percentages of the internal diameter of the cylinder, and the values of the length a of said upper section, the length b of said lower section and the lead L of the exhaust port opening over transfer port opening, all three expressed in degrees of crank shaft rotation being within the following ranges:

$a = 0° - 15°$
$b = 10° - 55°$
$x = 5 - 35$ percent
$y = 5 - 30$ percent
$L = 20° - 55°$

and satisfying the following relationship:

$$800 \leqslant a \cdot x^{1.3} + by + 20(L-20) \leqslant 1200,$$

whereby the engine when running produces a low broad blowdown pulse which in turn produces a low noise level exhaust.

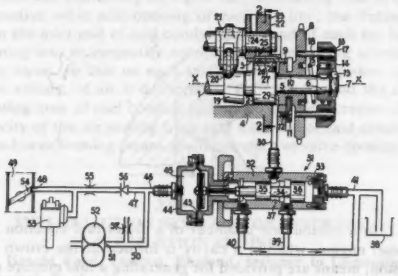
3,945,355

CAMSHAFT DEVICE FOR AN INTERNAL COMBUSTION ENGINE HAVING A VARIABLE DISTRIBUTION

Jean-Pierre Calviac, Maisons-Laffitte, France, assignor to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Boulogne-Billancourt, both of, France

Filed Mar. 31, 1975, Ser. No. 563,519
Claims priority, application France, Apr. 2, 1974, 74.11718
Int. Cl.² F01L 1/34
U.S. Cl. 123—90.18 10 Claims

1. In a camshaft device for an internal combustion engine having a variable distribution comprising means defining a fixed structure, a camshaft rotatably and axially slidably mounted relative to the structure, a fixed cylinder, a piston slidable in the fixed cylinder and defining with the cylinder a chamber, passage means including a constricted orifice for putting the chamber in communication with lubricating oil of the engine, an oil pressure modulator comprising a member defining an oil discharge orifice and a slide valve cooperative with the member to mask the discharge orifice to an extent which varies with the position of the slide valve relative to the



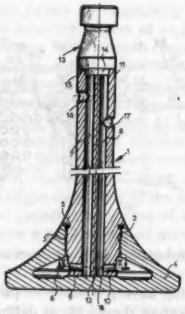
member; and passage means putting the chamber in communication with the discharge orifice; the provision of a pressure responsive capsule having a movable diaphragm which is connected to shift the slide valve relative to the member of the modulator, a first source of pressure representing the load of the engine, a second source of pressure representing the speed of the engine and passage means putting the interior of the capsule in communication with the first and second sources of pressure.

3,945,356

COOLED EXHAUST VALVE AND METHODS OF MANUFACTURE THEREOF

Karl Walter Kuhn, Saint Germain-en-Laye, France, assignor to Societe d'Etudes de Machines Thermiques, Saint Denis, France

Continuation of Ser. No. 304,901, Nov. 9, 1972, abandoned. This application July 2, 1974, Ser. No. 485,260
Claims priority, application France, Feb. 10, 1972, 72.04526
Int. Cl.² F01P 3/14
U.S. Cl. 123—41.41 19 Claims



12. A fluid-cooled valve member construction comprising a hollow-head portion and a stem portion connected to said head portion, said stem portion being formed with a plurality of longitudinally extending, spaced, substantially straight bore-like ducts for conveyance toward the inside of said hollow-head portion and reversely outwardly from said valve member of cooling fluid, said ducts being arranged in at least

one pair of diametrically opposed substantially co-extensive ducts in said stem, at least each one of said bore-like ducts communicating with at least one transverse duct on the one hand for directing a flow of said fluid in a fluid-feeding direction into said hollow-head portion through at least one of said bore-like ducts thus serving as fluid-feed ducts, and on the other hand for directing a flow of said fluid in a reverse direction outwardly of said hollow-head portion through another of said bore-like ducts thus serving as fluid return ducts, said bore-like ducts being uniformly distributed in equal circumferentially spaced relationship about the longitudinal central axis of said stem portion with feed ducts alternating successively with return ducts.

3,945,357

SUCTION PIPE ARRANGEMENT IN RECIPROCATING PISTON INTERNAL COMBUSTION ENGINES

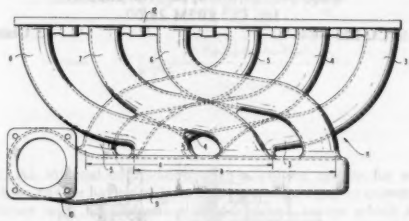
Erich Ableitner, Hochberg, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed June 17, 1974, Ser. No. 480,257

Claims priority, application Germany, June 22, 1973, 2321755

Int. Cl.² F02M *35/10*

U.S. Cl. 123—52 M **29 Claims**



1. A suction pipe arrangement for reciprocating internal combustion engines with in-line cylinders which includes a common suction pipe means for the cylinders having a fastening flange for the fastening of a valve connection, and tuned suction pipe means extending between the common suction pipe means and the cylinder head of the engine which are subdivided into two groups, characterized in that the common suction pipe means is located in the longitudinal direction adjacent the cylinder row approximately at the height of the cylinder head, and in that the first group of tuned suction pipes which branch off from the left portion of the common suction pipe means—as viewed in each case from the common suction pipe means toward the cylinder head—leads toward the right cylinder head connecting side while the second group of tuned suction pipes which branch off from the right portion of the common suction pipe means lead toward the left cylinder head connecting side, the tuned suction pipes extending substantially S-shaped in each case.

3,945,358

ROTARY INTERNAL COMBUSTION ENGINE WITH CAM TRANSMISSION

Brain Stanley Collins, c/o P.O. Box 6, 5 Pycombe Way Balga, Balga 6061, Australia

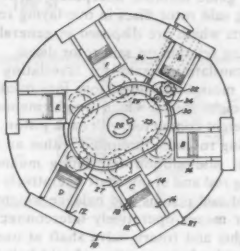
Filed Feb. 4, 1974, Ser. No. 439,586

Claims priority, application Australia, Mar. 20, 1973, 2662/73; Feb. 2, 1973, 2117/73; Apr. 18, 1973, 3056/73

Int. Cl.² F02B *75/26, 75/32*

U.S. Cl. 123—56 AA **9 Claims**

1. An internal combustion engine comprising a substantially cylindrical casing having grooves therein, a multilobed rotor being rotatably mounted within said casing, a plurality of substantially cross-sectionally U-shaped combustion chambers slideably mounted in said grooves in the casing and projecting inwardly so that the innermost point or face of said chambers are adjacent the outer profile of said rotor, the outer profile of said rotor having a circumferential toothed formation thereon, each of said chambers rotatably supporting a gear wheel which is intended to engage and bear upon the toothed formation on the outer profile of said rotor, ignition



means and fuel inlet and exhaust means being provided within said casing for each of said U-shaped chambers, the central longitudinal axis of each combustion chamber being angularly displaced from the radial axis of said casing such that the innermost end of said combustion chamber is displaced in the direction of rotation of said rotor.

3,945,359

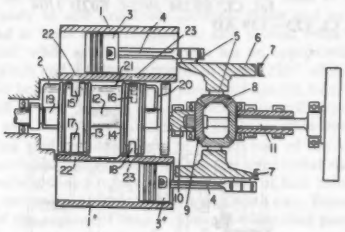
ROTOR ENGINE

Ryuzi Asaga, 1-10, No. 579, Fukuzumi Oshibedani-cho, Tarumi, Kobe, Japan

Filed Nov. 27, 1973, Ser. No. 419,340

Int. Cl.² F02B *75/26*

U.S. Cl. 123—58 R **6 Claims**



1. In a reciprocating piston, expansible chamber internal combustion rotary valve type engine embodying a plurality of pistons disposed in corresponding piston chambers or cylinders closed at one end by cylinder head means provided with ignition means therein; with said piston chambers radially grouped around and in parallel with a centrally disposed rotor chamber within which a rotary valve is disposed with axially spaced inlet and outlet passages communicatable with said piston chambers; and with air/fuel inlet passage means leading to and combustion gas exhaust passage means leading from the rotary valve, the improvement wherein

a. said piston cylinders each have a pair of axially spaced dual-acting intake and exhaust ports in a side wall portion thereof;

b. said rotary valve comprises an axial rotor shaft having an axially spaced pair of rotor discs affixed thereon, each of said rotor discs having axially oppositely facing intake and exhaust ports and corresponding intake and exhaust gas guiding passages opening radially in outer peripheries thereof; said outer peripheral passage openings disposed and adapted for predetermined rotative alignment se-

quentially with said cylinder intake and exhaust ports to provide fluid communication between said cylinders and rotor chamber and rotary valve therein;

c. said exhaust ports being in axially opposite end faces of said rotor discs and having adjacent eccentrically mounted exhaust guides affixed on said axial rotor shaft and to said respective rotor discs;

d. an intake guide member interposed between and interconnecting said rotor discs in overlaying relation to said intake ports which are disposed in generally axially opposed facing relation on said rotor discs;

e. motion translating means for translating the inherent reciprocal motion of said pistons into rotative motion of balance weight means which weight means comprises a balance weight connected with each piston, each balance weight being rotatably mounted within an annular bearing means; said motion translating means including a connecting rod and crank shaft operatively interconnecting each of said pistons and balance weights; and

f. bevel gear means operatively interconnecting said balance weights and rotary valve shaft at one side thereof whereby said relative motion of said balance weights is transmitted by said bevel gear means to effect rotation of said rotor shaft;

g. output shaft means operatively connected to said bevel gear means and projecting from an opposite side thereof; and

h. whereby an intake and exhaust of said plurality of cylinders is effected through said rotary valve as the latter is rotated in operation of the engine.

3,945,360

RPM REGULATOR FOR FUEL INJECTION PUMPS

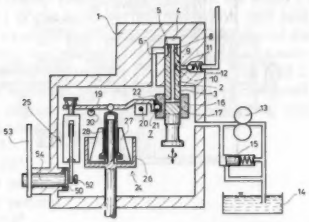
Helmut Laufer, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

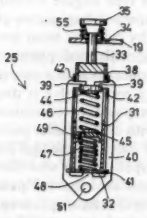
Filed Sept. 24, 1974, Ser. No. 508,890

Claims priority, application Germany, Oct. 3, 1973, 2349692

Int. Cl.² F02M *59/24*; F02D *1/04*

U.S. Cl. 123—139 AD **4 Claims**





1. In an rpm regulator for use with a fuel injection pump associated with an internal combustion engine, said regulator including a housing within which a suction chamber is defined, a control lever, a regulating spring assembly including at least one spring connected to the control lever, a device for generating an rpm signal and applying a corresponding force to the control lever in opposition to a force exerted by the regulating spring assembly, and an adjustment lever connected to the regulating spring assembly for adjusting the preload exerted by the regulating spring assembly, the improvement in the regulating spring assembly comprising:

a. two holding members;

b. two compression springs mounted within the holding members;

c. a cylinder having a closed bottom portion and serving as one of the holding members; and

d. a piston sealingly displaceable within said cylinder, said piston including a throttle aperture therein and defining an enclosed volume with said cylinder between said piston and the bottom portion of said cylinder, said enclosed volume being filled with fuel and being in communication with the suction chamber through said aperture, wherein said piston serves to separate the two compression springs from each other, and wherein relative outward movement of said holding members results in compression of said springs.

3,945,361

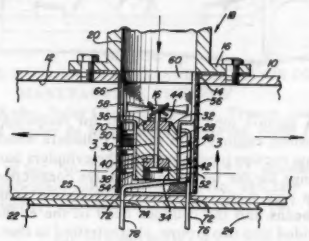
FUEL ATOMIZING DEVICE

Edward J. Piotrowicz, Sr., Rte. 2, Box 409, Walkerton, Ind. 46574

Filed Dec. 17, 1974, Ser. No. 533,541

Int. Cl.² F02M *29/00*

U.S. Cl. 123—141 **3 Claims**



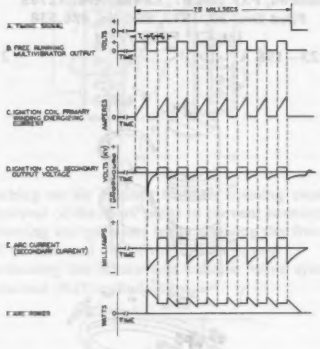
1. In combination an internal combustion engine including an intake manifold of the type including a main passage extending therethrough and an inlet port opening transversely into said passage intermediate its opposite ends, a fuel atomizing device comprising a central elongated bearing block, a rotary bladed axial impeller journaled from and outwardly of one end of said block, a cylindrical screen body substantially concentrically disposed about said block and said impeller in spaced relation thereto and with the latter spaced inwardly of one inlet end of said body, and mounting means stationarily supporting said block in position within said body and the latter from said manifold with said inlet end of said screen body disposed within the inlet port of said manifold and the remainder of said screen body extending substantially fully transversely across the central passage of the manifold into which said inlet port opens, said mounting means including a pair of opposite side elongated arms supported from said block and having one pair of ends thereof projecting endwise outwardly of said one end of said block, a split expansion ring disposed outwardly of said one end of said block and to peripherally spaced portions thereof said one pair of arm ends are secured, said expansion ring being expanded in said inlet end of said body and thereby expanding said inlet end of said screen body into seated position within said port.

3,945,362

INTERNAL COMBUSTION ENGINE IGNITION SYSTEM

John G. Neuman, Grosse Pointe, and Richard W. Johnston, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 397,766, Sept. 17, 1973, abandoned. This application Dec. 4, 1973, Ser. No. 421,579
Int. Cl.² F02P 1/00
U.S. Cl. 123—148 E 16 Claims



1. An internal combustion engine ignition system for use with an engine having at least one ignition arc-gap in communication with a combustion chamber and across which an ignition arc is produced to initiate combustion within the chamber, and a source of unidirectional voltage, said system comprising:

an ignition transformer having a primary winding and a secondary winding, the primary to secondary winding turns ratio being such as to produce in conjunction with the voltage of said source a secondary voltage sufficient to maintain an arc across said gap when the same has been instituted and for a first period of time, during which time primary current increases substantially linearly, the transformer further producing an arc-creating voltage in the secondary winding upon interruption of the current developed by the end of said time period, and maintaining the arc thereafter in inductive decrement action for a second period of time;

an electrical switching device operable to on and off modes in response to first and second applied voltage conditions, respectively;

a primary winding energizing circuit including said source, said device, and said primary winding in series;

a secondary circuit including said secondary winding and said arc-gap in series;

an oscillator effective when not energized to produce said second applied voltage condition and operable when energized to oscillate independently of engine operation from said first to said second applied voltage conditions, and vice versa, in said first period of time and said second period of time, respectively, whereby at the conclusion of each said second period of time when an arc subsists an abrupt current increase occurs in the primary winding;

means responsive to instantaneous primary current flow to trigger the oscillator to terminate each said first period of time when the primary current reaches a predetermined value; and

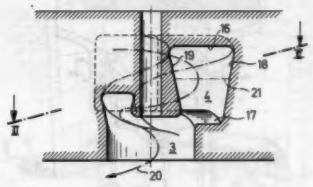
means effective to energize said oscillator for a longer on period at low engine speed than at high engine speed.

3,945,363

RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE WITH TWIST FORMING CONDUIT MEANS, ESPECIALLY IN THE INTAKE SYSTEM THEREOF

Ludwig Elsbett, Industriestrasse 14, and Günter Elsbett, both of D 8543 Hilpoltstein, Germany

Filed Aug. 28, 1973, Ser. No. 392,340
Int. Cl.² F01L 3/00
U.S. Cl. 123—188 M 7 Claims



1. A reciprocable piston internal combustion engine having a cylinder, a cylinder head associated with said cylinder and having therein twist forming passage means leading to said cylinder for conveying thereto a gaseous medium, valve means with a cylindrical opening and arranged in said twist forming passage means for controlling the supply of gaseous medium from said twist forming passage means including a helical section adjacent the cylindrical opening and an S-shaped curved section with one end adjacent said helical section and leading to said cylinder while one end of said curved section is located extending at least approximately from a first cross sectional plane approximately to a second cross-sectional plane which is determined by the cylinder axis and the axis of said valve means, both axes lying in said plane, said first cross-sectional plane and said second cross-sectional plane being substantially parallel to each other, and the end points of said S-shaped curved section being located on one hand at least approximately in said first cross-sectional plane and on the other hand at least approximately in said second cross-sectional plane, while said helical section has an approximately constant pitch and a helical angle of at least 220°, while the axis of said helix is in said second plane and spaced from that lateral wall of said passage means which is located opposite said helix axis, the cross-section of said helical section from its inlet joining said curved section to the section of the valve means controlled passage means having a trapezoidal shape, with its walls inclined relatively to said axes of said cylinder and valve means, and with its wider base facing away from the opening of the section of the valve means controlled passage means.

3,945,364

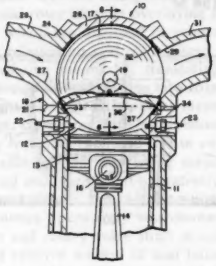
ROTARY VALVE FOR INTERNAL COMBUSTION ENGINE

Danny G. Cook, 128 Los Altos, Walnut Creek, Calif. 94598

Filed June 24, 1974, Ser. No. 482,648
Int. Cl.² F01L 7/00
U.S. Cl. 123—190 BD 7 Claims

1. In an internal combustion engine having at least one combustion chamber with a given diameter and which mounts a piston for movement through successive intake, compression, expansion and exhaust phases in a cycle of operation, the combination of a valve mounted at the head end of the combustion chamber, said valve having a circular outer periphery at least a portion of which extends across substantially the entire given diameter of the combustion chamber to completely define the head end thereof, said valve being formed at one side thereof with a concaval recess defining a passage which extends across a chord of said periphery, means forming an intake port and an exhaust port above the chamber head end, said ports being in juxtaposition to opposite sides of

said valve periphery, means for moving said valve in timed relationship with movement of said piston for turning said passage into simultaneous register with the intake port and chamber for inducting a charge during the intake phase, for thereafter turning the passage out of register with the combustion chamber for the expansion phase whereby the valve



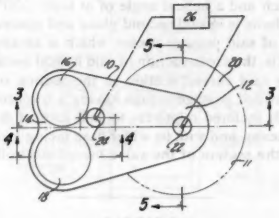
serves to confine the charge within the upper end of the cylinder, and for thereafter turning the passage into simultaneous register with said exhaust port and chamber for exhausting waste gases during the exhaust phase, and means to ignite a combustible charge within the chamber for the expansion phase.

3,945,365

LOW EMISSION COMBUSTION SYSTEM FOR INTERNAL COMBUSTION ENGINE USING MULTIPLE SPARK

Jose F. Regueiro, Muskegon, Mich., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed May 16, 1974, Ser. No. 470,407
Int. Cl.² F02B *19/10*
U.S. Cl. 123—191 **19 Claims**



1. In an internal combustion engine having a cylinder and a piston therein, a reduced emission combustion system capable of accommodating a relatively lean air/fuel mixture comprising:

a combustion chamber with a first end and a second end, a portion of the combustion chamber including the first end overlying the top of the cylinder and the second end spaced from the cylinder;

said combustion chamber having an upper wall formed to provide an undivided combustion chamber at the top dead center of said piston,

a squish area of relatively high area/volume ratio located above the top of the cylinder in registry with said first end of said combustion chamber of providing turbulence;

an intake valve and an exhaust valve disposed in said combustion chamber;

a first igniting means located proximate said first end of said combustion chamber;

a second igniting means located proximate said second end of said combustion chamber;

means for actuating said first igniting means and thereafter actuating said second igniting means;

said igniting means each having an end extending into said combustion chamber, said ends being in a plane substantially normal to the axis of said cylinder; and

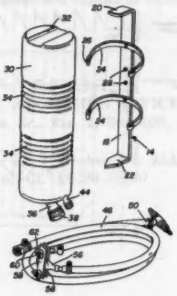
means for introducing a relatively lean fuel/air mixture into said combustion chamber.

3,945,366

OXYGEN SUPPLY SYSTEM FOR IC ENGINES

Roe I. Matthews, P.O. Box 67, Lowell, Ark. 72745

Filed Dec. 20, 1973, Ser. No. 426,538
Int. Cl.² F02B *77/04*
U.S. Cl. 123—198 A **2 Claims**



1. In combination with an internal combustion engine of the type having a reduced pressure combustible mixture induction system, an additive supply assembly including a container, a quantity of liquid additive in the container, and a conduit communicating the container with the induction system for supplying additive thereto, that improvement comprising the arrangement in which said conduit is connected to the bottom of said container, said container including an air inlet in the bottom thereof, an air inlet tube extending upwardly from the air inlet to a point adjacent to the top of the container, said air inlet including a control valve to control inlet of air into said container for controlling the pressure therein thus controlling the outflow of additive through the conduit, said container being constructed of substantially unbreakable plastic material and disposable after use, said container also being in the form of an elongated cylinder with generally flat top and bottom ends, and a bracket mounting said container vertically by engaging the top, bottom and peripheral wall thereof, said top end of the container having a notch extending diametrically thereof, said bracket having horizontally disposed tongues frictionally engaging the ends of the container with the upper tongue received in the notch, said bracket including resilient clips engaging the central portion of the peripheral wall of the container, said air inlet and conduit being offset from the center of the bottom of the container to facilitate the reception of the bottom tongue.

3,945,367

ENGINE MODIFICATION

James Glenn Turner, Jr., 3537 Colgate, Dallas, Tex. 75225

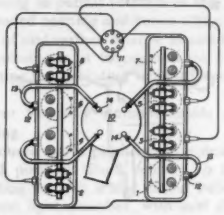
Filed June 5, 1974, Ser. No. 476,424
Int. Cl.² F02D *13/06*
U.S. Cl. 123—198 F **3 Claims**

1. In an internal combustion engine having N-cylinders with each cylinder having at least one removable spark plug for igniting a fuel mixture within the cylinder, and an intake and exhaust valve system for introducing the fuel mixture into the cylinder and exhausting the burned fuel after ignition, a

method of converting the engine to a (N/2)-cylinder internal combustion engine comprising:

selecting (N/2)-cylinders to be deactivated,

removing the spark plugs from the selected (N/2)-cylinders,



attaching an air cleaner to each opening created by the removal of the spark plugs to prevent contaminants from entering the cylinders while allowing the free movement of air into and out of the cylinders, and

deactivating the intake and exhaust valve system for the selected (N/2)-cylinders.

3,945,368

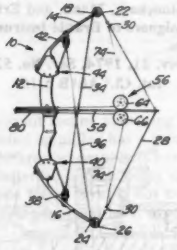
COMPOUND BOW WITH ROTATIONAL INDICATORS FOR ECCENTRIC WHEELS ON BOW LIMBS

George T. Jones, 12277 LaCadena Drive, Colton, Calif. 92324

Filed Apr. 28, 1975, Ser. No. 572,119

Int. Cl.² F41B 5/00

U.S. Cl. 124—24 R 7 Claims



1. In combination with a compound bow having eccentric wheels rotatably mounted thereon, a cable passing around the wheels, said wheels each turning approximately 180° between the rest position and full draw, a device for visually comparing the rotational rates of said eccentric wheels, a bowstring, said device comprising:

a support;

a pair of movable indicators mounted on said support and positioned adjacent the nocking point of the bowstring where they can readily be seen by the archer as he draws the bowstring, said support being engageable by the bowstring and movable rewardly thereby; and

means actuated by rotation of said eccentric wheels for driving the movable indicators so that a user may visually compare the relative rates of rotation of the indicators and the corresponding eccentric wheels with respect to one another.

3,945,369

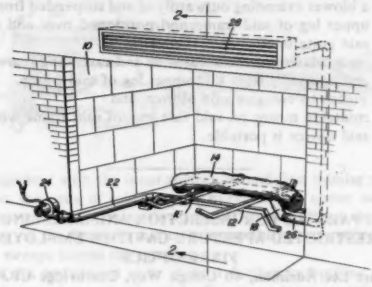
FIREPLACE HEAT EXCHANGER

Warren H. Adams, Box 5186, Mohave Valley, Ariz. 86440, and Corajean Adams, 14949 Roscoe Blvd., Panorama City, Calif. 91402

Filed June 20, 1974, Ser. No. 481,445

Int. Cl.² F23H 13/00; F24B 7/00

U.S. Cl. 126—164 2 Claims



1. In combination, a fireplace grate including an elevated grate member defining front and rear marginal portions as well as opposite side marginal portions, an elongated tubular heat exchanger element including a roughened exterior simulating a log and supported, in overlying relation, on said grate member with said elements spaced generally equally intermediate the front and rear marginal portions of said grate member and its opposite ends projecting endwise outwardly beyond said opposite side marginal portions of said grate member, means for closing the opposite terminal ends of said heat exchanger element and the end portions of said heat exchanger element projecting outwardly from said opposite side marginal portions of said grate member including integral downwardly inclined tubular inlet and outlet neck portions opening inwardly into the interior of said heat exchanger element, intake and discharge ducts each including inlet and outlet ends, the outlet and inlet ends of said intake and discharge ducts being coupled to the outer ends of said inlet and outlet neck portions, respectively, and means operatively associated with one of said ducts for effecting a forced flow of air inwardly through said inlet duct, through said heat exchanger element and outward through said discharge duct.

3,945,370

BURNER

Harry M. Essington, P.O. Box 4174, Coronado Station, Santa Fe, N. Mex. 87501

Filed Aug. 7, 1974, Ser. No. 495,405

Int. Cl.² F23B 3/00

U.S. Cl. 126—271.3 4 Claims

1. A portable burner for burning weeds or melting ice and snow comprising:

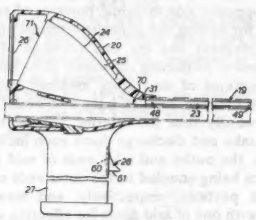
a. a frame of substantially rectangular shape having vertically disposed side legs and horizontally disposed lower and upper legs with the upper leg positioned above and spaced from the lower and in alignment therewith,
b. a grate open to the atmosphere extending forward of and depending from said lower leg, and having side, end and front walls and spaced grate rods extending below from said walls and secured thereto,
c. a blower extending outwardly of and suspended from said upper leg of said frame and positioned over and above said grate in alignment therewith,
d. an insulated handle secured to and extending rearwardly and upwardly from said upper leg of said frame,
e. means to energize said blower, and
f. rotatable means on said side legs of said frame whereby said device is portable.

3,945,371

APPARATUS FOR INSPECTION AND SAMPLING IN RESTRICTED APERTURE CAVITIES EMPLOYING FIBRE OPTICS

Stuart Lee Adelman, 40 Gough Way, Cambridge CB3 9LN, Cambridgeshire, England

Filed May 25, 1973, Ser. No. 364,531
Claims priority, application United Kingdom, May 26, 1972, 25034/72; Nov. 30, 1972, 55386/72; Dec. 12, 1972, 57281/73; Feb. 1, 1973, 5111/73; May 9, 1973, 22049/73
Int. Cl.[2] A61B *1/00, 10/00*
U.S. Cl. 128—2 B **12 Claims**



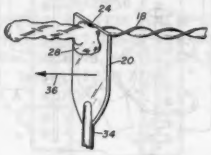
1. Apparatus adapted to be held in the hand for inspecting a cavity of restricted aperture comprising, a housing having a proximal and a distal end, a handle on said housing intermediate said proximal and distal ends, said housing formed with an aperture extending from said proximal end to said distal end, first optical means in said handle for generating light, second optical means in said housing for collecting a visible image, image display means in said proximal end of said housing to display an image received from said second optical means, said display means being visible from the proximal end of said housing, an elongated sheath removably inserted in said housing through said aperture with said sheath extending out the proximal end of said handle and beyond the distal end of said housing, latch means in said housing and said sheath for detachably securing said sheath in position extending through said housing, said sheath formed with a first and a second longitudinal duct, said first duct comprising an unobstructed passage from end to end of said sheath, and formed to detachably receive an elongated fleche, said fleche formed to sample matter from said cavity when said sheath is inserted into said cavity, said second duct terminating at the distal end of said sheath in a transparent window flush with the distal end of said sheath, first fibre optic means in said second duct extending from said first optical means to said window to conduct light to illuminate said cavity outside said window, and second fibre optic means in said second duct extending from said window to said second optical means.

3,945,372

MEDICAL TISSUE-OBTAINING SYSTEM

Albert R. Milan, 1335 Heather Hill Road, Baltimore, Md. 21239, and Raymond L. Markley, 707 Thornwood Court, Baltimore, Md. 21204

Continuation of Ser. No. 365,850, June 1, 1973, abandoned. This application Sept. 13, 1974, Ser. No. 505,709
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—2 B **5 Claims**



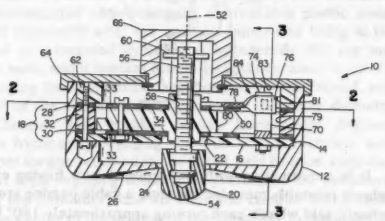
1. A medical system for obtaining tissue samples, comprising: tissue gathering means including a helically-shaped end section, said end section being formed of a flat, elongated, and essentially rectangular member twisted about its longitudinal axis such that the edges thereof which extend in a direction parallel to the longitudinal axis of said member are disposed in a helically wound fashion about said longitudinal axis, the surface of the end section being of a matte finish to enhance adhesion of tissue thereon;
means for manipulating said gathering means and being joined to the inner end portion of said end section; and,
a flat paddle-shaped member having a slot-like opening formed therein, at least a portion of the helically-shaped end section of the tissue gathering means being disposed within the slot-like opening and being movable relative thereto to transfer tissue adhering to the end section from said end section to a surface of the flat paddle-shaped member.

3,945,373

TOCODYNAMOMETER

David G. Tweed, Stoneham, Mass., and Eric LaWhite, South Royalton, Vt., assignors to Brattle Instrument Corporation, Cambridge, Mass.

Filed Nov. 21, 1974, Ser. No. 525,945
Int. Cl.[2] A61B *5/10*
U.S. Cl. 128—2 S **1 Claim**



1. A tocodynamometer for providing an electrical output related to body surface displacement of a patient, comprising
a housing,
a resilient support assembly having a pair of planar, parallel, generally circular spring elements having opposing surfaces, an outer, generally annular spacer mounted between said spring elements and fixed to said housing, and an inner spacer extending between said opposing surfaces of said spring elements inwardly of said outer spacer, said spacers being separated from each other so that said inner spacer is resiliently movable relative to said housing along an axis, said spring elements having cutouts in planar portions between said spacers,

said spacers having opposing wall portions generally parallel to said axis which comprise side walls of a light chamber,

a patient contacting member having a shaft extending along said axis, said shaft being threaded and extending through a correspondingly threaded opening in said inner spacer, said shaft having a patient contacting surface at one end and a knob on the other end, said knob being external to said housing to permit rotation of said threaded shaft in said threaded opening and hence adjustment of the initial position of said surface relative to said housing while said tocodynamometer is in position on a patient, thereby determining the operating range of said tocodynamometer, and

a transducer assembly mounted inside said housing and comprising

a light source and a photosensitive detector mounted in spaced positions fixed relative to said housing and extending through a said cutout between said spacers into said light chamber, with said detector being arranged to receive light from said source along a path, and

a rigid interrupter finger rigidly mounted on said movable inner spacer for movement therewith along said axis,

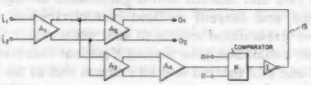
said finger having a permanently shaped portion arranged to extend in said light chamber and into said path between said source and said detector, whereby the amount of light from said source received by said detector will vary as a function of the position of said finger along said axis, said function being determined by the shape of said shaped portion.

3,945,374

BIOMEDICAL SIGNAL PROCESSING

Robert Bruce McClure, 3325 Stumphall Road, Collegeville, Pa. 19426

Filed Jan. 25, 1974, Ser. No. 436,507
Int. Cl.² A61B *5/04*
U.S. Cl. 128—2.1 M **8 Claims**



8. Electronic circuit means according to claim **4**, wherein the input differential amplifier has a gain of about one-tenth and the parallel differential amplifiers have a gain of about 30, the first of the latter amplifiers being operable at full gain when the reference signal level is not exceeded and at zero gain when the reference signal level is exceeded.

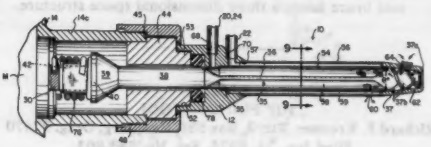
3,945,375

ROTATABLE SURGICAL INSTRUMENT

Anton Banko, Bronx, N.Y., assignor to Surgical Design Corporation, Long Island, N.Y.

Continuation-in-part of Ser. No. 241,019, April 4, 1972, Pat. No. 3,844,272, which is a continuation-in-part of Ser. No. 799,476, Feb. 14, 1969, Pat. No. 3,732,858, which is a continuation-in-part of Ser. No. 762,286, Sept. 16, 1968, Pat. No. 3,528,425. This application Apr. 30, 1973, Ser. No. 355,914
Int. Cl.² A61B *1/06*; A61M *1/00*; A61B *17/32*
U.S. Cl. 128—6 **20 Claims**

1. A surgical instrument for cutting tissue comprising a first tubular member having a closed end portion, said first tubular member formed with an opening therein for the tissue to enter to be cut, said first tubular member also formed with a shearing surface around at least a portion of the opening, a cutting tool within said tubular member, said cutting tool including an elastic shaft having a cutter at one end and said cutter having a body with a fluted cutting surface formed thereon which extends around the outer surface of the body and along the axis thereof, means engaging said shaft for rotating said cutting tool, resilient means for acting on the elastic shaft of said cutting tool in a direction longitudinal of the shaft urging the cutter toward the closed end portion of the first tubular member and the fluted cutting surface of the cutter into positive



engagement with the inner surface of said first tubular member in the area of said shearing surface, said cutter cutting surface and said opening shearing surface providing a shearing action on the tissue in said opening as the cutter cutting surface sweeps across the opening.

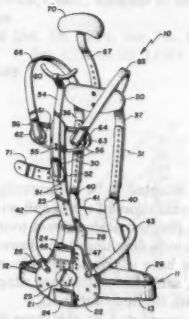
10. An instrument as in claim **1** further comprising elongated optical means mounted adjacent at least a portion of said first tubular member.

3,945,376

ORTHOPEDIC BRACE (ORTHESIS)

Walter Kuehnegger, Pleasant Lake, Mich., assignor to Otto Bock Orthopedic Industry, Inc., Minneapolis, Minn.

Filed Dec. 12, 1974, Ser. No. 532,067
Int. Cl.² A61F *5/02*
U.S. Cl. 128—78 **10 Claims**



1. An orthopedic brace for correction of the spinal deformities comprising:

a. a rigid pelvic band constructed and arranged to engage in close contour fitting relationship, the anterior, posterior and lateral hip portions of the pelvic region of a wearer;

b. a pair of posterior paraspinal upright members conforming to the general curvature of the back and pelvic region of a wearer, said paraspinal upright members being spatially disposed from each other and fixedly secured to said pelvic band at their lower ends;

c. an anterior upright member fixedly secured to said pelvic band at its lower end and formed so as to engage the abdominal region and gradually extend upwardly and outwardly to clear the xiphoid of the patient and follow the general anterior curvature in spatially disposed relationship;

d. a sternal cross bar fixedly secured to the upper end of said anterior upright member;

e. a scapular cross bar fixedly secured to the upper ends of said pair of posterior upright members;

f. a pair of rigid shoulder bars rigidly secured to the ends of said sternal and scapular cross bars and extending in curved, spatially disposed relationship to the contour of the shoulders of a wearer;

g. and a pair of flexible iliac crest members pivotally secured at each end thereof between said anterior and posterior uprights, the ends of said iliac crest members being disposed vertically above said pelvic band whereby said brace forms a three dimensional space structure.

3,945,377

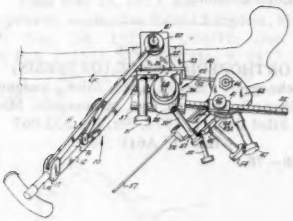
HIP PINNING TOOL

Richard F. Kronner, Rte. 2, Box 583, Roseburg, Oreg. 97470

Filed Jan. 24, 1975, Ser. No. 543,803

Int. Cl.² A61F 5/04

U.S. Cl. 128—92 EB 6 Claims



1. A surgical tool adapted to be temporarily mounted to the femoral shaft for installation of a hip nail within the femoral neck and head in a precise manner, said tool comprising,

a clamp structure including upper and lower pivoted clamping arms and a base supported in place by one of said clamping arms, said clamp structure adapted for clamped engagement with the femoral shaft,

an arm assembly supported by said base including an arm positionable into offset relationship with the femoral shaft,

mounting means adjustably mounting said arm assembly to said base of the clamp structure and permitting movement of said arm into said offset relationship, and

a guide assembly adjustably supported by said arm and positionable opposite the cephlad end of the femur, said guide assembly including,

upper and lower guide members adapted for movement relative to one another about an upright axis,

means locking said upper and lower guide members in a desired relationship,

a guide holder swingably mounted on the lower guide member for adjusted movement about a horizontal axis whereby said guide holder is positionable to compensate for antiversion or retroversion of the femur neck,

means locking said guide holder to said lower member,

said guide holder sequentially receiving a pin guide and drill guide,

means interlocking the guide holder and said pin and drill guides.

3,945,378

POSITIVE PRESSURE BREATHING CIRCUIT

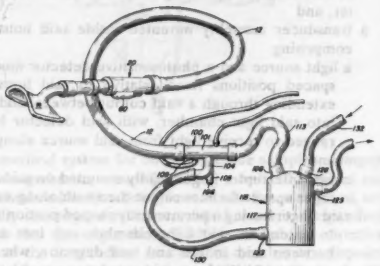
Bernard R. Paluch, 1607 E. Cedar Lane, Mount Prospect, Ill. 60056

Continuation-in-part of Ser. No. 451,855, March 18, 1974, Pat. No. 3,865,106. This application Feb. 10, 1975, Ser. No. 548,367

The portion of the term of this patent subsequent to Feb. 11, 1992, has been disclaimed.

Int. Cl.² A61M 17/00

U.S. Cl. 128—145.8 9 Claims



1. An a positive pressure breathing circuit for operation in conjunction with a positive pressure ventilator and interposed btween the ventilator and a patient-supported device such as a patient connection means, useful in conjunction with respiratory therapy, the improvement comprising in combination,

a concentrically oriented inhalation/exhalation circuit having an inner inhalation tube and an outer exhalation tube, said outer exhalation tube being spaced from and concentrically oriented with respect to said inner inhalation tube positioned therein,

said inner inhalation tube having a patient receiving terminal at one end thereof and a gas source terminal at the opposed end thereof in fluid communication with the positive pressurized source of said ventilator,

said outer exhalation tube having a patient receiving terminal at one end thereof and an exhaust end at the opposed end thereof,

said inner inhalation tube and said outer exhalation tube being in fluid communication with the ventilator during the inhalation and exhalation breathing cycles respectively,

inflatable occlusion means interposed between said inner inhalation tube and said outer exhalation tube and in fluid communication with said positive pressurized source of said ventilator such that said inflatable during the inhalation phase occlusion means is alternatively inflatable and deflatable during the exhalation phase in response to fluid pressure from the source thereof,

the gas flow in said inhalation tube being countercurrent with respect to the gas flow in said exhalation tube thereby to stabilize and maintain the temperature of the gas within said inner inhalation tube without any extraneous source of heat, while at the same time permitting inflation of said inflatable occlusion means during the inhalation cycle thereby to prevent the admixture of inhaled gases and exhaled gases during the inhalation cycle while concomitantly permitting the exhausting of exhaled gases through the system,

said ventilator functioning to create a gas back pressure in the inhalation tube during the exhalation cycle thereby to force exhaled gases to exhaust from the system through the exhalation tube due to the fluid gas pressure created therein,

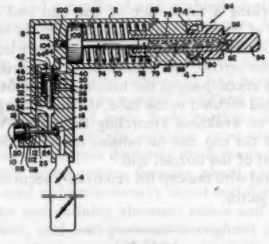
whereby gas suitable for patient inhalation enters said circuit through said inner inhalation tube under positive

pressure to be received by the patient during which time said inflatable occlusion means is fully inflated and interposed between said inner inhalation tube and said outer exhalation tube to prevent the admixture of inhaled gases with exhaled gases, while resisting any back pressure existing in said circuit, while exhaled gases exhaled by the patient are forced initially into said inhalation tube and are caused by the back pressure existing in said inhalation tube to exit through said exhalation tube, said occlusion means being deflated during the exhalation cycle to permit the exhausting of exhaled gases therethrough.

3,945,379
INJECTION DEVICE

Howard B. Pritz, and Sherwood G. Talbert, both of Columbus, Ohio, assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Aug. 8, 1974, Ser. No. 495,625
Int. Cl.² A61M 5/30
U.S. Cl. 128—173 H **9 Claims**



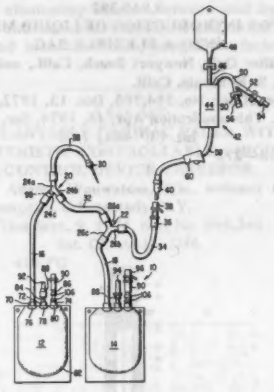
1. A pressure-operated injection device comprising:
a housing,
means to support in the housing an ampul having a plunger and a discharge opening,
a ram slidably mounted in the housing coaxially with the supporting means and adapted to actuate said plunger,
an accumulating chamber in the housing to accumulate gas,
means to supply a gas under prssure to the accumulating chamber,
pressure actuated means responsive to pressure of gas in the accumulating chamber to conduct gas to the ram from the accumulating chamber and stop the supply of gas to the accumulating chamber when the gas pressure in the accumulating chamber reaches a predetermined pressure.

3,945,380
PLASMAPHERESIS ASSEMBLY

William C. Dabney, Oakland; Basil L. Kristoff, Moraga; Robert D. Tuseth, Alameda, and John H. Hink, Orinda, all of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Aug. 21, 1974, Ser. No. 499,297
Int. Cl.² A61M 5/00
U.S. Cl. 128—214 R **22 Claims**

1. A medical assembly for biological, pharmaceutical or similar fluids comprising at least one fluid container means, at least one connector means having at least first, second and third angularly disposed fluid conducting branches, said fluid conducting branches being joined at one end at a common juncture to provide connecting fluid flow paths through said branches, said connector means including internal valve means operable at said common juncture to selectively close one of said branches to all fluid flow and to open a fluid flow path between the remaining two branches, said valve means operating to completely close the end of said closed branch at the common juncture to prevent fluid from collecting in the entrance to said closed branch at said juncture and being operable to close a selected branch by movement of the valve means from the end of one of said branches through the com-

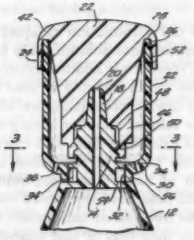


mon juncture and into the end of the selected branch to be closed, and a fluid conduit connecting said container means to one of the branches of said connector means.

3,945,381
EYE DROP DISPENSER AND CUP

Jules Silver, Norwich, Conn., assignor to Silver Industries, Inc., Norwich, Conn.

Filed Oct. 18, 1974, Ser. No. 516,092
Int. Cl.² A61H 33/04
U.S. Cl. 128—249 **12 Claims**



1. An eye drop dispenser and cover for use with a container for eye drop liquid having an open neck through which the liquid is dispensed, comprising, a cup having a first open end portion defining a generally circular free edge for engaging the eyelids of a person and a second opposite end portion having an opening therein for receiving and engaging the neck of the container with a portion of the neck of the container extending through said opening and into the cup; and a cover having a top portion overlying the entire free of said cup for completely closing said first open end thereof and an elongated stem portion extending into said cup and including means for operatively engaging and simultaneously closing the neck portion of the container; whereby said cover simultaneously closes the container and the entire open end of said cup; said stem portion of said cover including a free end portion and said means including a recess formed in said free end portion for receiving the neck of the container; said cup having a cylindrical bore formed therein defining said opening in its second end portion; said bore forming an annular wall in the

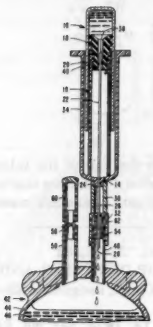
cup having a cross section substantially complementary to at least a portion of the container neck for frictionally receiving the container neck therein.

3,945,382

DEVICE FOR INTRODUCTION OF LIQUID MEDICATION INTO A FLEXIBLE BAG

Robert Walter Ogle, Newport Beach, Calif., assignor to IMS Limited, S. El Monte, Calif.

Division of Ser. No. 314,705, Dec. 13, 1972, Pat. No. 3,828,779. This application Apr. 15, 1974, Ser. No. 461,066
Int. Cl.² A61J 1/00
U.S. Cl. 128—272 2 Claims



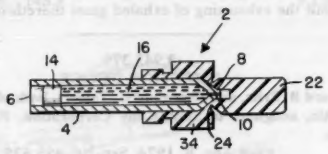
1. A device for the introduction of liquid medication into a flexible bag for intravenous solution, said bag having extending from the top thereof an additive-receiving flexible tube-like orifice and an outlet adapted to lead to an intravenous solution set, said device comprising an elongated generally cylindrical hollow tubular member having an open end and a closed end, a boss extending from said closed end, carried by the boss a cannula having a sharpened outer end, a rigid cylindrical sheath of fixed length surrounding said cannula and affixed to said boss, said sharpened outer end extending slightly beyond the free end of said sheath, said orifice having a diameter greater than that of said cannula, said sharpened outer end being adapted to be received in said flexible tube-like orifice and said sheath being adapted to engage said orifice to limit the advancement of said cannula into the orifice; within said tubular member, a thrust portion, a fluid passage extending longitudinally through the center of said thrust portion, the lower end of said fluid passage communicating with the upper end of said cannula at said boss, a cylindrical vial having a resilient stopper in its open end sealing on the inside walls of said vial, interlocking means on said thrust portion and cooperating interlocking means on said stopper, whereby upon interlocking of said plug with said thrust portion said vial is first held in an assembled but non-operating position and upon further interlocking of said plug with said cylindrical member, said plug is adapted to be pierced by said fluid passage and said fluid passage communicated with said vial without the application of substantial axial pressure on said plug and said plug is locked securely to said cylindrical member to permit aspiration upon withdrawal of said vial or to permit expulsion of the contents of said vial upon exertion of pressure on said vial.

3,945,383

UNIT DOSE AMPUL FOR JET INJECTOR

Russell B. Bennett, Worthington; William Millicovsky, and Howard B. Pritz, both of Columbus, all of Ohio, assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Aug. 8, 1974, Ser. No. 495,626
Int. Cl.² A61J 1/06
U.S. Cl. 128—272 3 Claims



1. In a unit dose ampul containing medicament for a jet injector comprising a tube open at one end and having an integral nozzle at the other end and a piston in the tube to seal the open end of the tube and adapted to advance liquid in the tube through the nozzle, the improvement comprising:

a sealing cap encompassing the nozzle and said other end of the tube and secured to the tube, the cap having a peripheral area of weakness encircling the nozzle whereby a portion of the cap can be broken off to expose the discharge end of the nozzle, and

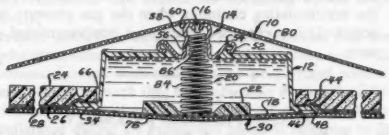
means integral with the cap for removably securing the tube to a jet injector.

3,945,384

ELECTRODE

Kenneth C. Allison, Crystal Lake; Howard T. Francis, Park Forest; Robert J. Abele, and Kenneth E. Pawlak, both of Chicago, all of Ill., assignors to Biomedical International Company, River Grove, Ill.

Filed Nov. 3, 1972, Ser. No. 303,335
Int. Cl.² D61B 5/04
U.S. Cl. 128—2.06 E 17 Claims



1. A biomedical electrode for use on a subject to take electrical measurements from said subject comprising, a solid metal being adapted for being electrically connected to an instrument for making electrical measurements, an ionic solution in contact with the solid metal, means for holding the ionic solution in contact with the solid metal, said means including a porous phase separator having one side contacting the ionic solution and the other side being adapted for direct contact with a surface of the subject, said porous phase separator being wettable by the ionic solution to wet said other side for ionic conduction between the surface and the ionic solution through the phase separator, and resilient means connected to said one side of the porous phase separator contacting the ionic solution for urging the porous phase separator outward from the ionic solution.

3,945,385
SUCTION CATHETER

Marvin A. Sackner, Miami Beach, Fla., assignor to Physicians' Medical Patent Development Corporation, Newark, N.J.

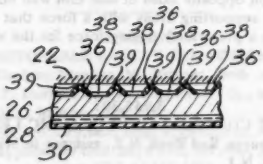
Filed Oct. 25, 1974, Ser. No. 518,154
Int. Cl.² A61M 25/00
U.S. Cl. 128—350 R **10 Claims**

1. A suction catheter of a size suitable for insertion into a body cavity containing a gas such as the nose, mouth or larynxgotracheobronchial tree comprising an elongated tube formed of a flexible material having a lumen running interiorly thereof, said tube having an distal end with an opening for placing said lumen in communication with the interior of the body cavity and a proximal end adapted to place said lumen in communication with a source of pressure lower than that existing at the distal end of said tube, regulation means for controlling, from said proximal end, the suction applied at said distal end, said tube being defined by wall portions forming a main body portion and an integral distal end portion of limited length relative to said main body portion, said main body portion being of generally circular cross-section and said lumen being of constant diameter throughout said main body portion, said wall portions forming plural axially extending flanges spaced circumferentially about said distal end portion of said tube and defining alternate raised and depressed surface portions, said wall portions throughout said raised and depressed surface portions being of substantially constant thickness, and apertures in said depressed surface portions between said flanges extending through said wall portions of said tube into said lumen, the total cross-sectional area of all of said apertures being sufficient to permit only a nominal vacuum to be applied at said distal end opening upon application of suction to said catheter.

3,945,386
DISPOSABLE DIAPER

Edward Anczurowski, Dollard des Ormeaux, and Brian E. Julien, Pierrefonds, both of Canada, assignors to Domtar Limited, Canada

Filed Aug. 8, 1972, Ser. No. 278,729
Int. Cl.² A61F 13/16
U.S. Cl. 128—287 **1 Claim**

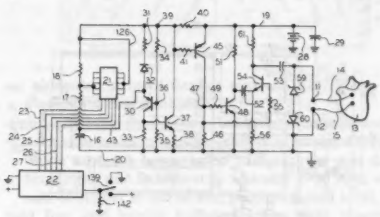


1. A diaper comprising a hydrophobic diaper facing sheet, an absorbent pad, a discrete perforated plastic film interposed between said facing sheet and said pad, an impervious backing sheet covering the side of said pad remote from said facing sheet, said pad and said discrete perforated plastic film being in intimate contact to ensure body fluids passing through said perforations immediately contact said pad, said perforated film being indented about each perforation thereby to provide a funnel like surface surrounding each perforation, said funnel like surface tapering in toward said pad, said perforations being sufficiently large to permit easy penetration of body fluids yet sufficiently small that the facing sheet bridges each of said perforations, each said perforation is equivalent in open area to a hole one-sixteenth to three-eighths inch in diameter and said perforations are located on centers spaced between one-fourth and three-fourths of an inch, said film substantially eliminating contact between said hydrophobic facing sheet and said pad whereby migration of said fluids from said pad back into said hydrophobic facing sheet is impaired.

3,945,387
IMPLANTABLE CARDIAC PACER WITH CHARACTERISTIC CONTROLLABLE CIRCUIT AND CONTROL DEVICE THEREFOR

Theodore P. Adams, Wauwatosa, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 9, 1974, Ser. No. 504,346
Int. Cl.² A61N 1/36
U.S. Cl. 128—419 PG **11 Claims**



1. An implantable cardiac pacer comprising:

a. pulse generator means for applying stimulus pulses to a heart, said generator means having at least one operating characteristic that is subject to variation,

b. means for detecting control signals generated remotely from said pacer,

c. ring counter means having a plurality of output terminals, said ring counter means being responsive to each in a succession of detected control signals by respectively changing the voltage states on said output terminals from a first state to different states to thereby produce a sequence of binary number representative signals on said output terminals,

d. means connected with said output terminals and responsive to each binary number change thereon by varying said characteristic,

e. means for resetting said ring counter means for its output terminals to attain said first state in response to a predetermined number of binary number states having occurred,

f. said ring counter means comprising a series of interconnected flip-flops, said flip-flops respectively having output terminals (Q) and clock input signal terminals (C) and data input terminals, said flip-flops each being characterized by transferring whichever high or low state signal is on its data input terminal to its Q output terminal when a clock signal is applied to its C input terminal,

g. said Q output terminal of the first and next flip-flops other than the last flip-flop in the series being connected to the ensuing data input terminal of subsequent flip-flops,

h. said C input terminal being connected for simultaneously receiving a clock signal corresponding with each detected signal for sequentially advancing a signal that is initially on the data input terminal of the first flip-flop to the Q output terminal of the last flip-flop.

i. gate means having a plurality of input terminals connected to receive signals opposite of the signals on the Q output terminals, respectively, of each but the last flip-flop in said series, said gate means having an output terminal

coupled with the data input terminal of said first flip-flop, the output terminal of said gate means changing state when the flip-flops other than the last flip-flop are operated to have their output terminals all at the same state to thereby apply an initializing signal state to the data input terminal of said first flip-flop and to establish the Q input terminal of the last flip-flop in a final state corresponding with said initial state, whereby the next detected control signal will start recycling of said flip-flops, and

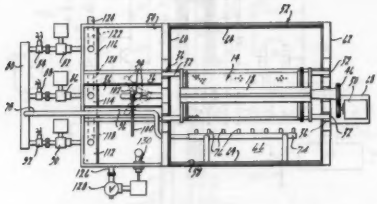
j. the aforesaid ring counter output terminals being the points intermediate the Q output terminals and data input terminals of successive flip-flops.

3,945,388

APPARATUS FOR COUNTERFLOW RINSING OF WORKPIECES

Chester G. Clark, Grosse Pointe Woods, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Filed July 29, 1974, Ser. No. 492,620
Int. Cl.² B08B 3/02
U.S. Cl. 134—57 R **13 Claims**



1. In an apparatus for performing a counterflow liquid treatment of workpieces, the improvement comprising a framework for supporting workpieces at a stationary position at a treating station, nozzle means for applying a liquid to the surfaces of workpieces when disposed at the treating station, plural reservoirs including a first reservoir containing a first liquid and a second reservoir containing a second liquid, supply means for sequentially supplying said first liquid and thereafter said second liquid to said nozzle means for a prescribed time period, collecting means for recovering the liquid discharged from said nozzle means, drain means in said collecting means for returning the recovered said first liquid to said first reservoir and the recovered said second liquid to said reservoir, respectively; means for sequentially positioning said drain means in communication with said first reservoir and said second reservoir in coordinated relationship with the operation of said supply means, inlet means for introducing a selected quantity of fresh make-up liquid to said second reservoir, transfer means for transferring a portion of said second liquid to said first reservoir and in admixture with said first liquid therein, and outlet means in said first reservoir for discharging a portion of said first liquid from said first reservoir.

3,945,389

FOLDABLE WALKER

Alfred A. Smith, 13114 Margate St., Van Nuys, Calif. 91401

Filed May 11, 1973, Ser. No. 359,354
Int. Cl.² A61H 3/00
U.S. Cl. 135—45 A **18 Claims**

1. A collapsable walker comprising:

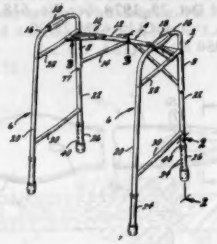
a cross brace having a bearing at each of its extremities;

a pair of gate legs with one of said gate legs being pivotally mounted in each of said bearings for rotation between an open position with the gate legs positioned generally transversely of the cross brace and a collapsed position with the gate legs folded against the cross brace;

corner braces connected adjacent each of said bearings;

said corner braces each being connected to one of said gate legs and to said cross brace to provide rigid bracing support between the gate legs and the cross brace when the gate legs are in an open position, and

said corner braces being movable to permit rotation of the gate legs to a collapsed position.

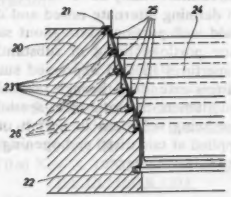


3,945,390

SEALING SYSTEM FOR SHUTOFF ELEMENTS

Richard Huber, Modling near Vienna, Austria, assignor to Klinger AG, Zug, Switzerland

Filed Apr. 5, 1974, Ser. No. 458,427
Claims priority, application Austria, Apr. 9, 1973, 3119/73
Int. Cl.² F16K 25/00
U.S. Cl. 137—1 **19 Claims**



16. A method of producing a shutoff in a sealing system comprising the steps of

moving a blocking member relative to a housing member along a closing axis,

pressing and deforming a deformable thin wall body sealingly between said blocking member and said housing member along at least two annular supporting areas on each of said housing and blocking members into free spaces on opposite sides of said thin wall body from said annular supporting areas with a force that substantially exceeds a prescribed closing force for the shutoff in the sealing system.

3,945,391

FLOAT CONTROLLED HYDRAULIC LEVELER

Robert G. Pearse, Red Bank, N.J., assignor to Microtork, Inc., Red Bank, N.J.

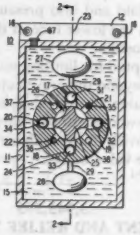
Filed Nov. 18, 1974, Ser. No. 524,363
Int. Cl.² F16K 17/36
U.S. Cl. 137—45 **3 Claims**

1. In an apparatus for hydraulically correcting misalignment between two members adapted to rotate with respect to each other, the combination comprising:

a housing assembly sealed to encapsulate a fluid under pressure, said housing assembly including means for attachment to one of said members and having a first reference line adapted to rotate in concert with said one member when it moves;

fluid distribution means having first and second conduits for transmitting said fluid between said housing assembly and an actuator means adapted to rotate said one member in one direction in response to a change in fluid pressure in one conduits and in the other direction in response to a change in fluid pressure in the other conduit;

valve means for selectively changing the fluid pressure in said first and second conduits, said valve means including first and second members adapted to move relative to each other, said first member being rigidly attached to said housing assembly so as to be fixed with respect to said first reference line, said second member containing a second reference line disposed in a pre-determined position with respect to said first reference line and adapted to move with respect to said first reference line when said first and second members move with respect to each other, and said first and second members including port means for opening a fluid access passage to one of said conduits when said reference lines move with respect



to each other in one direction and for opening a fluid access passage to the other of said fluid conduits when said reference lines move with respect to each other in the other direction; and control means cooperating with said valve means and having float means for maintaining said second reference line in pre-determined orientation with respect to the earth and said first member is fixed with respect to said housing assembly, while said second member is free to move with respect to said first member and said float means is attached to said second member and said port means includes input and output apertures in said first member and grooves in said second member adapted to equally bridge said input and output apertures when said second reference line is disposed in said pre-determined position with respect to said first reference line and said input apertures include two pressure ports, said output apertures include four control ports and two exhaust ports, and each groove links a pressure port or exhaust port to two control ports.

3,945,392

DISPOSABLE SAFETY FLOAT VALVE

David W. Deaton; Stephen M. Brower, both of Dallas, and Marshall P. Durham Jr., Desota, all of Tex., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Division of Ser. No. 279,062, Aug. 9, 1972, Pat. No. 3,848,628. This application Oct. 10, 1974, Ser. No. 513,597

Int. Cl.² A61M *1/00*

U.S. Cl. 137—205 9 Claims

1. In a medical suction assembly, the combination comprising:

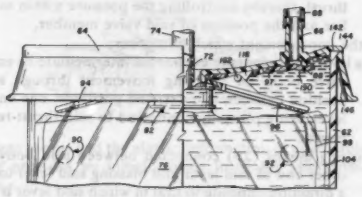
a fluid container having an annular bead extending around the upper portion thereof,

a lid for said fluid container having a fluid inlet for communicating with a patient area and having a vacuum port for being connected to a source of vacuum,

said lid including an annular groove on the underside thereof for sealingly receiving said bead to provide a vacuum tight seal for said container,

an annular side wall extending from said annular groove and being outwardly flared to define a transient sealing portion below said groove for abutment with said annular bead of said container, said transient sealing portion providing a temporary vacuum seal upon the application of vacuum to said vacuum port sufficient to cause said lid to be pulled downwardly upon said container to seat said annular bead within said annular groove, and

a float valve attached to said lid and including means movable in response to a predetermined level of fluid in said fluid container to obstruct said vacuum port to prevent fluid from being drawn through said vacuum port wherein said float valve comprises:



an elongated strip of flexible material having low fluid absorption characteristics,

a portion of said flexible strip being detachably connected to the underside of said lid, said strip having a free end which normally hangs below said vacuum port due to bending of said flexible strip when the fluid level within said container is below said predetermined level,

said free end having sufficiently low fluid absorption characteristics to float on the fluid when the fluid reaches said predetermined level within said container to prevent the fluid from being drawn through said vacuum port.

3,945,393

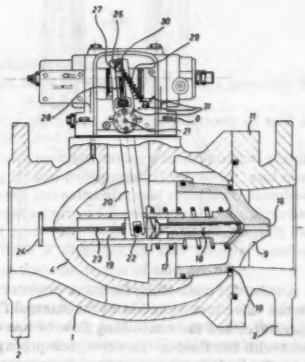
REGULATING VALVE

Giuseppe Teatini, Via della Bastia, 20, Casalecchio di Reno, Bologna, Italy (40033)

Continuation-in-part of Ser. No. 446,402, Feb. 27, 1974, abandoned, which is a continuation-in-part of Ser. No. 331,898, Feb. 12, 1973, abandoned. This application Aug. 30, 1974, Ser. No. 502,011

Int. Cl.² G05D *16/10*

U.S. Cl. 137—220 11 Claims



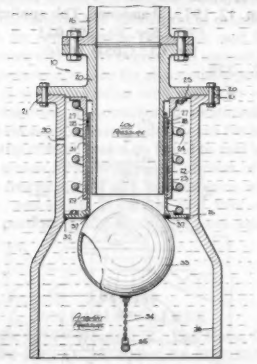
8. In a valve for maintaining the rate of flow of a fluid through a pipe substantially constant, said valve comprising:

a valve body (1, 8, 11) having a fluid inlet port and a fluid outlet port,
a hollow member (4) within said body between said ports defining a central chamber,
a first duct (5) connecting said inlet port to said chamber,
a second duct (16) connecting said outlet port to said chamber, and
a valve member (9) movable in response to pressure changes within said chamber and cooperating with a valve seat (10) in said body to control said fluid flow,
thrust-responsive means (22, 23, 24) positioned to receive the hydrodynamic thrust of fluid entering said valve-body through said inlet port, and connected to control the flow of fluid through said second duct in dependence on said thrust, thereby controlling the pressure within said chamber and the position of said valve member,
the improvement which comprises:
a lever (20) pivotally connected intermediate its end to said valve body for swinging movement through a median position between two extreme positions, one end of said lever being pivotally connected to said thrust-responsive means,
spring means (29) connected between said body and the other end of said lever and biassing said lever to swing in a direction opposite to that in which said lever is urged by said thrust-responsive means, the total force exerted by said spring means being proportional to the degree of extension of said spring means, which lies at an acute angle to said lever such that pivotal movement of said lever increases the component of said total force which is effective to resist the force applied by said thrust-responsive means as said total force decreases, and decreases said component as said total force increases.

3,945,394
PRESSURE-RESPONSIVE VALVE

Arthur Francis Sullivan, Redmond; Frank Howard Brockett, III, Bellevue, and Lewis John Harthan, III, Redmond, all of Wash., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Mar. 21, 1975, Ser. No. 560,575
Int. Cl.[2] F16K *31/18*
U.S. Cl. 137—430 10 Claims

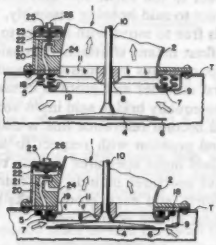


1. A valve for controlling flow and pressure of fluid therein while the valve is surrounded by an external fluid at an ambient pressure, and for controlling flow of heavier solids when present with the fluid in the valve, comprising:
a. a valve body having an upward facing opening adapted to be joined to a hydraulic conduit, a downward facing opening below the upward facing opening, an open interior providing a continuously downward passage for fluid and solids from the upward opening to the downward opening and being in fluid pressure communication with the upward opening;
b. a valve seat having an upper face and a lower face and being disposed to have the upper face in fluid pressure communication with fluid inside the body and the lower face in fluid pressure communication with the ambient pressure of fluid outside the body and having an open passway from the lower face to the upper face;
c. means for maintaining the seat vertical and movable vertically in relation to the body;
d. a seal disposed and adapted to prevent pressure communication of the ambient pressure to the upper face of the seat;
e. downward force means for forcing the seat toward the downward facing opening of the body;
f. a downward movement limit stop to prevent downward movement of the seat beyond a preselected down position where the lower face of the seat is in the downward opening of the body;
g. a buoyant gate disposed and adapted to float upward in the external fluid and into pressure-sealing contact with the passway in the lower face of the seat when the seat is in the down position; and
h. a retainer adapted for limiting movement of the buoyant gate upward beyond the preselected down position of the seat, said retainer being also adapted for permitting downward movement of the gate and for retaining the gate from moving farther than a preselected distance away from the valve body.

3,945,395
VENT AND RELIEF VALVE

Robert H. Reinicke, Mission Viejo, and Richard L. Kenyon, Costa Mesa, both of Calif., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed July 11, 1974, Ser. No. 487,612
Int. Cl.[2] F16K *45/00*, *17/00*
U.S. Cl. 137—495 12 Claims



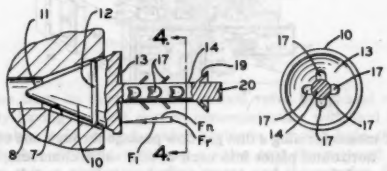
1. A vent and relief valve comprising a valve body having a vent passage therethrough communicating at one end with the interior of a tank containing pressurized fluid; coaxial vent valve and relief valve members at such one end movable axially in said body and having interengaged seats to close said passage to retain pressurized fluid within said tank; actuating means operatively connected to said vent valve member to move the same axially in one direction with respect to said relief valve member to disengage said seats for venting said tank through the other end of said passage as during filling of the tank; said relief valve member having an area thereof exposed to fluid pressure in said tank and being moved axially in the opposite direction with respect to said vent valve member to disengage said seats in response to fluid pressure in said tank acting on said area exceeding a predetermined value to relieve tank pressure greater than such predetermined value through the other end of said passage; said body having pilot pressure and vent passages respectively communicating with tank pressure and with said body vent passage downstream of

said seats, and a control passage leading to a seating chamber to which an opposite area of said relief valve member is exposed; and a tank pressure actuated pilot valve movable in said body and communicating said control passage with said pilot pressure passage in response to tank pressure being less than such predetermined value and with said pilot vent passage in response to tank pressure exceeding such predetermined value whereby reduced pressure in said chamber acting on such opposite area permits tank pressure acting on the first-mentioned area of said relief valve member to urge said relief valve member to disengage its seat from said vent valve member seat.

3,945,396
RAPID SEATING CHECK VALVE

Robert W. Hengesbach, 7886 Munson Road, Mentor, Ohio 44060

Filed Feb. 24, 1975, Ser. No. 552,042
Int. Cl.² F16K *17/04, 15/02*
U.S. Cl. 137—496 **7 Claims**



1. A check valve comprising a body having a cavity with an inlet and an outlet communicating therewith, respectively;
a seat in the cavity between the inlet and outlet;
a valve plug member movable generally axially of the seat away from the seat in the opening direction and toward the seat in the closing direction, said valve plug having a rear face facing downstream away from the seat;
a stem member carried by the valve plug member and coaxial therewith;
return flow directing means on the plug member and exposed directly to the return flow through the valve, and shaped and arranged to render the return flow through the valve effective to cause rapid seating of the plug member; and
said return flow directing means comprising a shallow concavity in the rear face of the valve member, coaxial with the stem, and extending radially outwardly therefrom toward the periphery of said rear face.

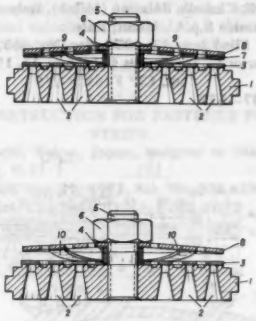
3,945,397
PLATE VALVE

Albert F. Riedel, Schongau (Lech), Germany, assignor to Hoerbiger Ventilwerke Aktiengesellschaft, Vienna, Austria

Filed Apr. 4, 1974, Ser. No. 458,028
Claims priority, application Austria, Apr. 1, 1973, 3176/73
Int. Cl.² F16K *15/08*
U.S. Cl. 137—514 **6 Claims**

1. A plate valve, comprising:
a valve seat including passage means;
a flexible closure plate for controlling the flow of a fluid through said passage means;
a resilient catcher plate for limiting the opening stroke of said closure plate, said catcher plate is in the form of a domed spring with the concave surface thereof facing said valve seat for biasing said closure plate to close said passage means, said catcher plate being mounted at its central portion only along a central axis of said plate valve and extending in spaced relation over said valve seat; and

whereby said flexible closure plate and said resilient catcher plate provide dampening for the initial opening of said

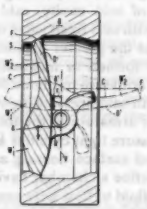


passage means and the elastic deformation of said catcher plate provides an initial closing force for said closure plate.

3,945,398
CHECK VALVES

Henry Masheder, 13 Well Walk, Hampstead, London, NW3, England

Continuation-in-part of Ser. No. 375,006, June 29, 1973, abandoned, which is a continuation of Ser. No. 280,178, Aug. 14, 1972, abandoned, which is a continuation of Ser. No. 43,847, June 5, 1970, abandoned. This application July 11, 1974, Ser. No. 487,666
Int. Cl.² F16K *15/02*
U.S. Cl. 137—527.8 **12 Claims**

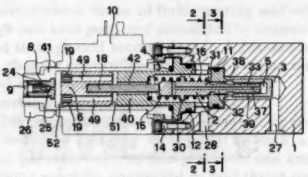


1. A valve assembly comprising:
a hollow, main body member disposed on a generally horizontal axis;
a frusto-conical valve seat disposed interiorly of said main body member; and
a circular closure member having a frusto-conical periphery conforming to said frusto-conical valve seat, said closure member being journalized in said main body member for rotation about a horizontal axis normal to the direction of the axis of said valve seat, said axis of rotation being displaced from a diameter of said closure member a distance less than the radius of said member,
said closure member having a weight distribution such that the center of gravity thereof remains on one side of a vertical plane including said axis of rotation throughout the entire range of movement of said member and acts through a progressively decreasing moment arm as said member rotates toward a horizontal open position so as to develop a correspondingly decreasing closing, biasing torque.

3,945,399
ELECTRICALLY MODULATED HYDRAULIC-PRESSURE REGULATING VALVE

Paolo Tirelli, Cinisello Balsamo (Milan), Italy, assignor to Atos Oleodinamica S.p.A., Milan, Italy

Filed June 17, 1974, Ser. No. 480,162
Claims priority, application Italy, Apr. 11, 1974, 21259/74
Int. Cl.² F16K 31/10
U.S. Cl. 137—529 27 Claims



1. An electrically modulated hydraulic pressure regulating valve comprising a valve body, said body defining a cylindrical space closed at one end, at least one inlet port entering said space and at least one outlet port, a fixed valve member partially housed in said cylindrical space, said fixed valve member defining an elongated cylindrical cavity having two portions of slightly different internal diameters and said cavity being closed by a wall at the end of the portion having the lesser diameter, said fixed valve member having radial passageway ports establishing a communication between said cavity and said cylindrical space, a movable valve member in the form of a slider-shutter having a complex profile including as significant component parts a frustoconical portion and a round cylindrical projection having a plurality of annular grooves in the periphery thereof, said movable valve member being slidably housed in guided relation in said cylindrical cavity with said cylindrical projection cooperating as a piston in the lesser diameter portion of said cavity, said frustoconical portion being cooperable with said fixed valve member for closing said cylindrical cavity at the greater diameter end thereof, a pressure-tight cylinder formed of magnetically different parts, a movable magnetic armature mounted for axially sliding movement in contact with said pressure-tight cylinder and inside it, a magnetic counter-armature in the form of a hollow cylinder carried by said pressure tight cylinder and having a planar and non-continuous end surface bearing against said fixed valve member so as to define a chamber having an axial bore which allows a hydraulic fluid to flow between said chamber and said pressure-tight cylinder, a pusher in the form of a rod, connected to said movable magnetic armature, said pusher passing through said axial bore of said magnetic counter-armature and acting axially against said movable valve member, an electric coiling and a magnetic yoke surrounding said pressure-tight cylinder so that said movable magnetic armature undergoes an attraction force under the influence of a current flowing through said coiling, fastening means for securing said pressure-tight cylinder and said counter-armature to said valve body; and sealing means preventing oozings of hydraulic fluid between said fixed valve member, said counter-armature and said pressure-tight cylinder.

3,945,400
REVERSE-AIR MANIFOLD AND FLOW PASSAGE MODULE

Philip B. Slakey, Orinda, Calif., assignor to Industrial Clean Air, Inc., Berkeley, Calif.

Division of Ser. No. 432,589, Jan. 10, 1974, Pat. No. 3,898,062. This application Apr. 4, 1975, Ser. No. 565,192
Int. Cl.² B01D 46/02
U.S. Cl. 137—608 8 Claims

1. A reverse-air manifold and flow passage module for use in connecting a main gas manifold to bag houses, said module comprising:

a. spaced-apart horizontal plates forming the top and bottom of said module,

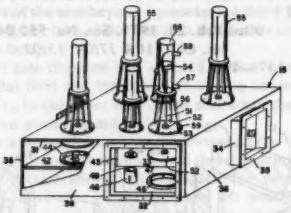
b. spaced-apart vertical side plates,

c. spaced-apart vertical end plates,

d. a pair of spaced-apart vertical partitions

extending the length of said module, said partitions and horizontal plates bounding and forming a portion of a reverseair manifold centrally of said module, said portion being open at its ends,

e. said module having two valve chambers therein, one on each side of said reverse-air manifold portion, each valve chamber being bounded by one of said partitions, one of said side plates, said end plates and said horizontal plates,



f. means forming a first gas flow passage through one of said horizontal plates into each of said valve chambers, each such first gas flow passage terminating in an annular valve seat opening into said valve chamber and facing the other of said horizontal plates,

g. means forming a second gas flow passage within said module from said reverse-air manifold portion into each valve chamber on either side thereof, each such second gas flow passage terminating in an annular valve seat opening into said valve chamber and facing the said other of said horizontal plates, whereby the valve seats of said first and second gas flow passages face in the same direction,

h. means forming a third gas flow passage opening into each of said valve chambers through the side plate of said module bounding the valve chamber.

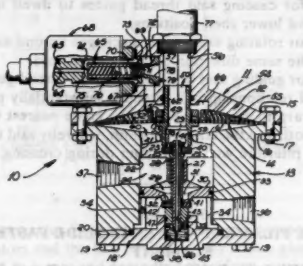
3,945,401
COMBINATION VALVE

Roger Greenwood, North Hollywood, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Division of Ser. No. 461,743, April 17, 1974, which is a division of Ser. No. 359,653, May 14, 1973, which is a continuation-in-part of Ser. No. 217,539, Jan. 13, 1972, abandoned. This application Sept. 16, 1974, Ser. No. 506,259
Int. Cl.² F16K 31/12
U.S. Cl. 137—627.5 3 Claims

1. Fluid pressure responsive apparatus comprising: a hollow valve body having a flexible diaphragm sealed at its edge thereto, said valve body having a hollow interior divided into upper and lower pressure chambers by said diaphragm, said lower chamber including first and second spaces, said valve body having a cylindrical bore on one side of said diaphragm; a vent valve connected from said bore to the atmosphere, said bore having an axis, said diaphragm having a central hole therethrough symmetrical about said bore axis; a hollow cylindrical body fixed relative to and sealed relative to said diaphragm in a position extending through said diaphragm hole, said cylindrical body being located in a position slidable inside said bore concentric therewith; a first O-ring located around said cylindrical body in a position symmetrical about said axis, one of said bodies including means to trap said first O-ring in a substantially fixed position relative thereto, said first O-ring

providing a fluid tight sliding seal between said bodies; a first spider fixed relative to said valve body internally thereof on the other side of said diaphragm, said first spider having a cylindrical hole therethrough, said cylindrical body also being slidable through said first spider hole, said first spider having other holes therethrough to admit fluid under pressure from said first space therebelow into said second space between said first spider and said diaphragm, said valve body having an outlet port in communication with said second space; a second spider fixed relative to said valve body internally thereof in a position sealed to the wall of said lower chamber, said lower chamber being located on the said other side of said diaphragm, said second spider generally dividing said second



space from an inlet chamber in said valve body, said valve body having an inlet port in communication with said inlet chamber, said second spider having a circular hole therethrough concentric with and a valve seat therearound said bore axis; a poppet including upper and lower valve discs; means to guide movement of said poppet about and along said axis; a spring to bias said lower and upper valve discs against said second spider valve seat and the lower end of said cylinder body, respectively; selectively operable means to admit fluid under pressure to said upper chamber or to exhaust said upper chamber through said bore, said valve body being spaced from said one diaphragm side; and a sponge-like layer positioned between said one diaphragm side and said valve body.

3,945,402

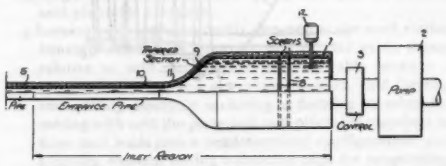
LAMINAR FLOW PIPE SYSTEM

Peter J. Murphy, 108 Clover Lane, Ithaca, N.Y. 14850

Filed Oct. 25, 1974, Ser. No. 518,035

Int. Cl.² F15D *1/02*, *1/06*

U.S. Cl. 138—37 **4 Claims**



1. A fluid conveying system having laminar fluid flow and a Reynolds number in excess of 2200, comprising a straight pipe of circular cross-section having an inlet and outlet, and fluid turbulence control means connected to said inlet for supplying said fluid to said inlet, said pipe having an internal roughness determined from the formula:

$$(e/d)\,R \leq 200$$

where e is the root mean square height of the roughness of the internal surface of the pipe, d is the internal diameter of the pipe, and R is the Reynolds number, and wherein said fluid turbulence control means is of a form in which the turbulence level of said fluid at said inlet conforms to the formula:

$$(U/\bar{V})R^{1.47} \leq 3500$$

where U is the cross-section average of V′, V′ is the root mean square time average of (V − V″), V″ is the time average of V, V is the axial velocity of the fluid, $\bar{V}$ is the cross-section average of V″, and R is the Reynolds number.

3,945,403

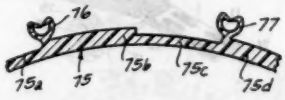
TUBE CONSTRUCTION FOR FASTENER PROFILE STRIPS

Takashi Noguchi, Tokyo, Japan, assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Apr. 19, 1973, Ser. No. 352,459

Int. Cl.² B65D *33/30*; F16L *11/10*

U.S. Cl. 138—118 **9 Claims**



1. A tube construction for releasably interlocking fastener profile strips to be attached to the surface of film material for bags comprising:

an elongate plastic tube having a plurality of fastener profiles thereon;

said profiles of the profile strips being complementary shaped with an equal number of female profiles and male profiles;

said profiles having a size and shape so that the male profiles will releasably interlock with the female profiles;

said profiles being arranged on the surfaces of the tube construction in two groups with the male profiles being on one-half of the circumference of the tube and the female profiles being on the remaining one-half of the circumference;

the spacing distance between adjacent profiles on each one-half circumference being equal;

the film material on either side of each profile being of different thickness to provide reinforcement therefore;

the spacing distance between end profiles between each said one-half circumference being the same as the spacing between adjacent profiles.

3,945,404

MEAT CASING WITH INTERNAL RELEASE COATING

Kenichi Yamamatsu, Hisai; Shozo Yamada, Ichishi; Hiroaki Nouni, both of Mie, and Shuzi Yokoyama, Hisai, all of Japan, assignors to Towa Kako Co., Ltd., Tokyo, Japan

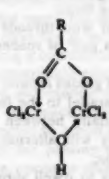
Filed Mar. 1, 1974, Ser. No. 447,149

Claims priority, application Japan, July 20, 1973, 48-80724

Int. Cl.² F16L *11/00*

U.S. Cl. 138—118.1 **3 Claims**

1. A food casing having the inner surface thereof coated with a water-soluble chromium complex having the formula:

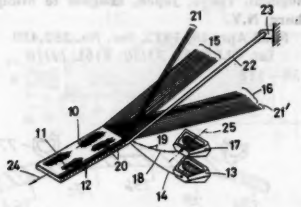


where R is an aliphatic radical with 13 to 18 carbon atoms, said compound being polymerizable by heat into a water-insoluble film.

3,945,405
METHOD OF MANUFACTURING SLIDE FASTENER STRINGERS HAVING COUPLING ELEMENTS WOVEN INTO A FABRIC TAPE

Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Feb. 25, 1975, Ser. No. 552,756
Claims priority, application Japan, Feb. 27, 1974, 49-23115
Int. Cl.² D03D *35/00, 49/50;* A44B *19/42*
U.S. Cl. 139—22 **5 Claims**

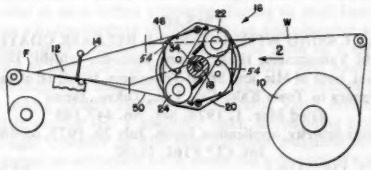


1. In the manufacture of slide fastener stringers having a woven fabric tape carrying along its one longitudinal edge a row of continuous coupling elements which is spirally coiled and woven into the tape fabric in the course of the tape weaving, a method comprising the steps of reciprocally moving a shuttle carrying an element-forming filament transversely in crisscross relation to warp yarns alternately over and under a mandrel wire located adjacent a selected group of warp yarns during the shedding of the latter which form a longitudinal tape edge so as to permit said filament to interweave with said group of warp yarns and to loop over said mandrel wire, and rotating said shuttle about its central axis during each cycle of its reciprocal movement thereby removing a twist on the filament imparted by said reciprocal movement of the shuttle.

3,945,406
LENO SELVEDGE DEVICE AND METHOD OF FORMING A LENO SELVEDGE

Karl W. Wueger, North Brookfield, Mass., assignor to Crompton & Knowles Corporation, Worcester, Mass.

Filed Aug. 26, 1974, Ser. No. 500,792
Int. Cl.² D03C *11/00, 7/00*
U.S. Cl. 139—54 **7 Claims**



6. A method of forming a two thread leno selvage in a loom comprising the following steps:

a. extending a pair of leno threads from a pair of supply packages through a pair of spaced guides to the selvage in a loom;

b. rotating said thread guides around a horizontal axis which lies substantially parallel to the fell line of the cloth and which lies substantially between and intermediate said guides so that they will alternately occupy upper and lower shed positions;

c. causing said guides to dwell substantially in said upper and lower shed positions;

d. rotating said supply packages around said axis once for each rotation of said guides and in the same direction thereof; and

e. guiding said threads from said thread guides in a spaced relationship in a direction substantially parallel to the warp to a point between the guide nearest the fell of the cloth and the fell of the cloth, whereby said threads will not interfere with each other during crossing.

7. A device for forming a leno weave at the selvage of a loom comprising:

a. a pair of spaced guides for a pair of leno threads from a pair of supply packages;

b. means for rotating said guides around a horizontal axis which lies substantially parallel to the fell line of the cloth and which lies intermediate said guides so that they will alternately occupy upper and lower shed positions;

c. means for causing said thread guides to dwell in their upper and lower shed positions;

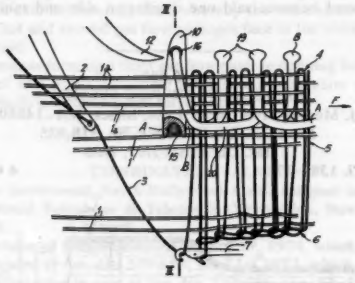
d. means for rotating said supply packages around said axis and in the same direction as said guides; and

e. means for guiding said threads from said thread guides in a spaced relationship in a direction substantially parallel to the warp to a point between the guide nearest the fell of the cloth and the fell of the cloth, whereby said threads will not interfere with each other during crossing.

3,945,407
MULTIPLE FILAMENT WOVEN-IN SLIDE FASTENER ELEMENT

Horst Jakob, Choisy-le-Roi, France, assignor to Prestil, Choisy-le-Roi, France

Division of Ser. No. 429,819, Jan. 2, 1974, which is a continuation-in-part of Ser. No. 295,019, Oct. 4, 1972, abandoned. This application Jan. 23, 1975, Ser. No. 543,467
Claims priority, application France, Oct. 13, 1971, 71.36698
Int. Cl.² D03D *3/00;* A44B *19/12*
U.S. Cl. 139—384 B **1 Claim**



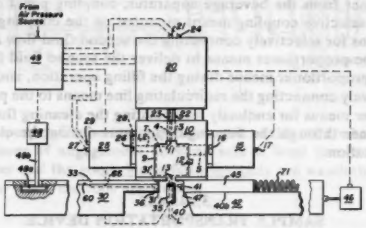
1. A slide fastener element comprising a tape woven with warp and weft yarns, two separate resilient filaments inserted between said warp and weft yarns, each said filament being formed into a helix, the loops of one said helix being wound in a direction opposite the direction of winding of the loops of the other said helix, said loops being imbricated at spaced intervals, a lateral portion of each loop constituting a coupling member along an edge of said tape, the loops of each helix being interconnected by connecting portions extending in the direction of the warp yarns on the side of said helices opposite to the coupling members, every alternate loop belonging to a different one of said helices formed by said two filaments, the tape distorting stress in one said helix being essentially offset by the tape distorting stress in the other said helix by virtue of said helices being wound in opposite directions.

3,945,408

APPARATUS FOR FORMING AND TRIMMING THE LEADS OF ELECTRONIC COMPONENTS

Dewey D. Halligan, 6251 Empress Court, San Jose, Calif. 95129

Filed June 3, 1974, Ser. No. 475,563
Int. Cl.² B21F *45/00*
U.S. Cl. 140—105 6 Claims



1. Apparatus for processing electronic components such as transistors and the like having a body with a plurality of leads aligned in a row and extending therefrom, comprising:

an elongated guide means forming a transistor body passageway extending between an entry end and an exit end and having a single slot along the length of its bottom side through which the transistor leads project, the width of said slot being only slightly wider than the width of one of said leads, said entry end being elevated relative to said exit end and said passageway extending through a work station;

metering means disposed along the length of said guide means between said entry end and the work station for feeding transistors one-at-a-time to the work station;

positioning means disposed at the work station for receiving and causing each transistor fed thereto to be stopped and positioned with a predetermined orientation;

a die assembly disposed at the work station beneath and on one side of said guide means and movable between a retracted position and a lead engaging position, said die assembly including a die plate having a lead receiving notch in one edge thereof, a pair of pivotable lead engaging members lying beneath said die plate with one end of each member positioned proximate said notch, and a lead length determining shoulder lying beneath the ends of said pivotable members;

a forming and cutting assembly disposed at the work station beneath and on the opposite side of said guide means relative to said die assembly and movable between a retracted position and a working position, said forming and cutting assembly including a forming member for mating with said die plate and said pivotable members to form said leads into a predetermined configuration, and a cutting element having a shearing edge for cooperating with said shoulder to trim the formed leads to a predetermined length, said cutting element including an elongated member having an upper surface terminating in said shearing edge on the side nearest said die assembly means, and said forming member including a body portion slideably mounted to said surface and a shaping element formed on the side of said body portion nearest said die assembly for engaging said ends of said pivotable members and deforming the leads beneath said notch, and means urging said body portion into a position with said shaping element extending over said cutting edge when said forming and cutting assembly is in said retracted position but permitting said cutting element to move relative to said forming member a predetermined distance in the direction of said die assembly after said forming member has mated with said die assembly; and

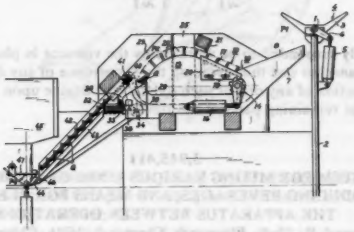
actuating means for actuating said metering means to feed a transistor to the work station, for actuating said positioning means to receive and position the fed transistor, and for then simultaneously actuating said die assembly means and said forming and cutting assembly means to form and trim the leads of the transistor.

3,945,409

DEVICE FOR FEEDING LENGTHS OF WIRE TO A PROCESSING MACHINE

Rudolf Scherr; Walter Jamnig; Hans Gött, and Klaus Ritter, all of Graz, Austria, assignors to EVG Entwicklungs- und Verwertungs-Gesellschaft m.b.H., Graz, Austria

Filed May 30, 1975, Ser. No. 582,247
Claims priority, application Austria, May 30, 1974, 4500/74
Int. Cl.² B21F *23/00*
U.S. Cl. 140—112 14 Claims



1. An apparatus for feeding aligned lengths of wire from a bundle to a processing machine, such as a lattice welding machine,

comprising, in combination:

an inlet means operable to convey and hold the bundle for division into smaller portions;

conveyor means disposed near said inlet means, operable to convey portions of wire away from said inlet means;

divider means associated with at least one of said conveying or inlet means and operable to divide said bundle into portions of wire;

holder-separator means disposed near said conveyor means and being operable to receive the portion of wire from said conveyor means and separate it into individual wires in a predetermined alignment, for conveyance to the processing machine.

3,945,410

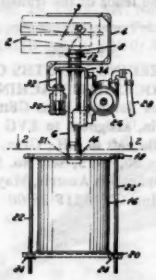
CATALYTIC CONVERTER CANNISTER EMPTYING AND FILLING DEVICE

William G. Clogg, Madison Heights, Mich., assignor to Kent-Moore Corporation, Warren, Mich.

Filed Apr. 1, 1974, Ser. No. 456,833
Int. Cl.² B65B *1/08*
U.S. Cl. 141—67 2 Claims

1. An improved device for filling a catalytic converter with catalyst material and for emptying such material from such a converter while the converter is mounted in an automobile exhaust system including a conduit having means attached to one end thereof for clampingly engaging the catalytic converter mounted in the automobile exhaust system for rigid suspension therefrom and such that the upper end of the conduit is firmly connected to a port leading to the interior of the catalytic converter for passing catalytic material therethrough in one or the opposite direction, a rigidly formed receptacle attached to the other end of the conduit and adapted to hold catalytic material, and a vibrator rigidly connected to the conduit, the improvement comprising employing a substantially straight tube of rigid material throughout its length as the conduit and employing means for rigidly con-

necting the vibrator to the tube of rigid material and further means for rigidly yet releasably connecting the receptacle to the other lower end of the tube thereby enabling the tube, the receptacle and the catalytic converter from which the tube is



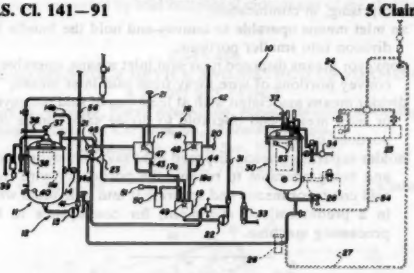
rigidly suspended to be vibrated by the vibrator in phase with one another and thus avoiding the occurrence of any dampening action of any one of such parts of the device upon any one of the remaining parts of the device.

3,945,411

SYSTEM FOR MIXING VARIOUS KINDS OF FLUIDS FOR PRODUCING BEVERAGES, AND MEANS FOR CLEANING THE APPARATUS BETWEEN OPERATIONS

Sigmund P. Skoli, Elmwood; Chester J. Witt, Chicago, and Hartl R. Jones, Bensenville, all of Ill., assignors to Mojonnier Bros. Co., Chicago, Ill.

Filed Apr. 1, 1974, Ser. No. 456,760
Int. Cl.² B65B *3/04*
U.S. Cl. 141—91 5 Claims



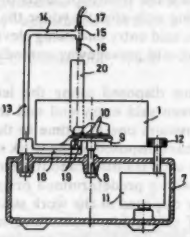
1. System for cleaning a beverage apparatus comprising a source of a first fluid flow, fluid degasifying means for receiving the first fluid flow from its source and degasifying the flowing first fluid, a source of a second fluid flow, proportioner means for receiving the flowing degasified first fluid from the degasifying means, for receiving the flowing second fluid from the second fluid flow source, and for mixing the degasified first fluid flow and the second fluid flow to form a beverage flow during a filling operation, a source of a beverage carbonating gas flow, beverage carbonating means for receiving the beverage flow from the proportioner means, for receiving the carbonating gas flow, and for mixing the carbonating gas flow and the beverage flow during the filling operation, filler means for receiving the flow of carbonated beverage and for directing discrete quantities of the carbonated beverage to discrete receptacles during the filling operation, a source of cleaning fluid flow, cleaning fluid injector means for introducing the cleaning fluid flow into the proportioner means during a cleaning operation, a source of a cleaner, cleaner injector means for injecting the cleaner into the proportioner means during the cleaning operation, means for routing the first fluid, the second fluid, and the beverage through the proportioner means, the carbonating means and into the filler means during the filling operation, and for routing the cleaning fluid and cleaner sequentially through the proportioner means, the carbonating means and the filler means during the cleaning operation, recirculating line means for recirculating the cleaning fluid and cleaner from the filler means to the proportioner means, heater means in the recirculating line means for heating the recirculating cleaning fluid and cleaner, drain means for draining the cleaning fluid and cleaner from the beverage apparatus, coupling panel means, and selective coupling means mounted on the coupling panel means for selectively connecting the second fluid flow source to the proportioner means to deliver the second fluid flow to the proportioner means during the filling operation, and alternatively connecting the recirculating line means to the proportioner means for endlessly recirculating the cleaning fluid and cleaner through the beverage apparatus during the cleaning operation.

3,945,412

SAMPLE TRANSPORTATION DEVICE

Bo Gosta Forsstrom, Jarfalla, Sweden, assignor to LKB-Produkter AB, Bromma, Sweden

Filed Feb. 12, 1975, Ser. No. 549,278
Claims priority, application Sweden, Feb. 18, 1974, 7402104
Int. Cl.² B65B *43/50*
U.S. Cl. 141—130 2 Claims



1. Transportation device for successively moving a number of sample containers past a treatment position, for instance for adding liquid to the containers or sucking liquid from the containers, characterized in that it comprises a rotably journalled sample container stand in which the sample containers are arranged along a path running from the centre of the stand towards its periphery, the stand being provided with a guiding track running along the sample container path, the track being provided with a marking at each sample container, driving means for rotating the stand and two mechanically linked means which are radially displaceable along the stand, one of said means being provided with a mouthpiece and the other being provided with a track follower and also with means for detecting the markings and for generating a signal to stop the driving means at such a detection.

3,945,413

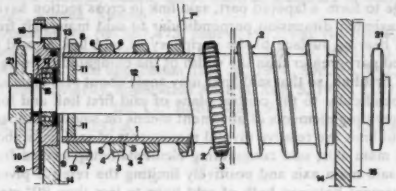
FEEDING DEVICE

Bror Evert Eriksson, Pl 1813, 820 11 Vallsta, Sweden

Filed Mar. 19, 1975, Ser. No. 559,982
Claims priority, application Sweden, Mar. 19, 1974, 7403653
Int. Cl.² B27C *1/12*
U.S. Cl. 144—246 R 10 Claims

1. Feeding device comprising a number of rotatable rolls, each roll being provided with a number of individual, at least part-annular feeding members around the circumference thereof and suitably provided with toothing to feed goods in

a direction essentially perpendicular to the axis of rotation of the rolls, said feeding device being characterized in that at least one of the feeding members is inclined, so that a plane in which its perimeter essentially lies forms oblique angles to

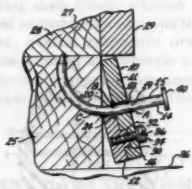


planes perpendicular to the rotation axis of the rolls, whereby the places of engagement between said at least one feeding member and the goods being fed constantly are wandering to and fro when the rolls are rotated.

3,945,414
APPARATUS FOR DEFLECTING A NAIL INTO AN ARCUATE PATH

Dean R. Gordon, 5153 N. 29th Ave., Phoenix, Ariz. 85017

Filed Mar. 27, 1975, Ser. No. 562,501
Int. Cl.² B25C *3/00*
U.S. Cl. 145—46 **9 Claims**



1. An apparatus for deflecting a nail into an arcuate path and directing the arcuately configured nail into a workpiece, said apparatus comprising:

a. a guide plate for placement adjacent the workpiece, said guide plate having a slot formed to extend inwardly from one edge thereof and extend between the planar surfaces of said guide plate, the slot of said guide plate adapted to receive and supportingly guide movements of the nail from the inlet to the outlet thereof; and

b. a deflection block mounted on said guide plate adjacent the outlet of the slot of said guide plate, said deflection plate having an inclined surface which projects therefrom at least part way over the outlet of the slot of said guide plate with the inclined surface of said deflection block spaced a predetermined distance from the outlet of the slot of said guide plate so that when the shank of a nail emerges from the outlet of the slot of the guide plate that shank will engage the inclined surface of said deflection block and be deflected thereby into an arcuate configuration of predetermined curvature.

3,945,415
APPAREL VALISE

Monty D. Febuary, 17D Kings Lane Road, Greenville, S.C. 29611

Filed June 16, 1975, Ser. No. 586,981
Int. Cl.² B65D *31/02*
U.S. Cl. 150—7 **6 Claims**

1. An apparel valise for packing and carrying folded shirts and the like therein comprising:

a substantially rectangular back section;

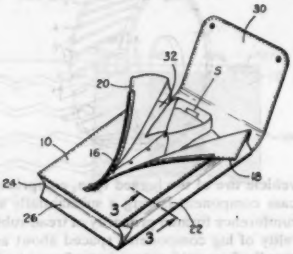
a substantially rectangular front section;

a medial opening formed in said front section providing convenient access to the interior of said valise, said medial opening defining a pair of front side panels on adjacent sides of said medial opening;

closure means for selectively closing said medial opening;

a pair of expandable side gusset sections joining said front and back sections so as to accommodate a plurality of shirts packed in said valise;

an expandable bottom gusset section joining said back and front sections and said pair of side sections providing a closed bottom end for said valise;



an open top defined by the joining of said of back and front sections and said pair of side gusset sections at an upper free edge thereof;

an upper flap section integral with said back section extending over said front section providing a cover over said open top of said valise; and

a double opening provided by said open top with said flap raised and said medial opening with said side panels folded outwardly providing convenient packing and unpacking of said shirts in said valise;

whereby shirts packed in said valise are maintained in a fresh and wrinkle-free condition during travel.

3,945,416
STEERING WHEEL COVER

Ho Yon Rim, Rua Iperdig 270, Perdizes, Sao Paulo, Brazil

Filed June 20, 1974, Ser. No. 481,145
Int. Cl.² B62D *1/06*
U.S. Cl. 150—52 M **5 Claims**

1. A cover for a steering wheel rim comprising:

a circular wire having a fixed diameter greater than the inside diameter of the steering wheel rim and less than the outside diameter of the steering wheel rim; and

an annulus of flexible elastic material having an outside diameter corresponding to the diameter of the circular wire and a radial width substantially corresponding to the axial circumference of the steering wheel rim, the flexible elastic material being secured to the circular wire along the circumference of the annulus;

whereby when the circular wire is placed in abutment with the surface of the steering wheel rim, and the flexible elastic material is stretched around the axial circumference of the steering wheel rim, the elasticity of the material causes the material to grip the steering wheel and form a toroid corresponding to the shape of the steering wheel rim.

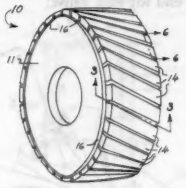
3,945,417
LUGGED VEHICLE TIRE, AND METHOD OF BUILDING SAME

Albert A. Harrelson, Jr., Asheboro, N.C., assignor to Harrelson Rubber Company, Asheboro, N.C.

Continuation-in-part of Ser. No. 449,917, March 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 366,101, June 1, 1973, abandoned. This application Sept. 27, 1974, Ser. No. 509,793

Int. Cl.² B60C *11/04*

U.S. Cl. 152—209 B **5 Claims**



1. A vehicle tire of the lugged type, comprising:

a carcass component having a substantially smooth outer circumference formed primarily of tread rubber material;

a plurality of lug components spaced about and extending outwardly from said outer circumference of said carcass component, said lug components being formed of retread rubber material precured under heat and high pessure separately from said carcass component and having a greater cut and abrasion resistance than said tread rubber material of said carcass component;

a layer-like mass of cushion gum material, having a minimum thickness of approximately three-eights to one-half inch, overlying substantially all of said circumference of said carcass component between said carcass circumference and said lug components in permanently bonded interconnecting relationship thereto; said cushion gum material having a faster curing rate and a greater flexibility than said rubber materials of said carcass and lug components, and said layer-like mass of said cushion gum material having been cured in situ between said carcass and lug components.

3,945,418
LINKAGE ARRANGEMENT FOR ANTISKID VEHICLE TIRE CHAINS

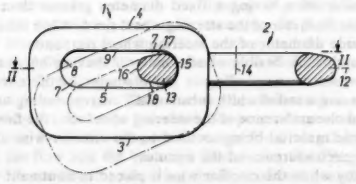
Anton Müller, Unterkochen, Germany, assignor to Eisen- und Drahtwerk Erlau Aktiengesellschaft, Aalen, Germany

Filed June 26, 1974, Ser. No. 483,106

Claims priority, application Germany, June 30, 1973, 2333462

Int. Cl.² B60C *27/02*

U.S. Cl. 152—243 **12 Claims**



1. In combination with an antiskid tire chain; at least two links interengaged so as to be pivotal relatively about a main axis substantially parallel to the tire surface adjacent thereto, the first of said links being a member with non-round cross section having an elongated opening of greater length than width through which said second link passes, said first link having a bearing surface at one end of said opening and said second of said links having a surface arcuate in cross section on said bearing portion in engagment with said bearing surface and said link in cross section having sides extending from said bearing surface outwardly toward its periphery which converge to form a tapered part, said link in cross section having a maximum dimension perpendicular to said main axis from said bearing surface to the periphery of said link at said tapered part greater than the width of the elongated opening in said first link, so that said links may angle about said main axis perpendicular to the central plane of said first link and form cooperating elements of abutment means on said links operable to limit the relative pivotal movements of said links about said main axis, said cooperating elements being spaced from the said main axis and positively limiting the relative pivotal movement between both of said links to less than 90° maximum about said main axis.

3,945,419
ARRANGEMENT FOR SECURING THE BEADS OF A PNEUMATIC TIRE IN THE RIM THEREFOR

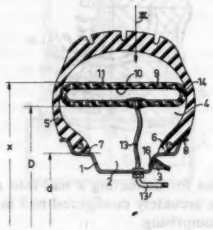
Johannes Kosanke, Letter, Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

Filed Oct. 21, 1974, Ser. No. 516,416

Claims priority, application Germany, Oct. 22, 1973, 2352871

Int. Cl.² B60C *5/06, 17/00*

U.S. Cl. 152—339 **8 Claims**

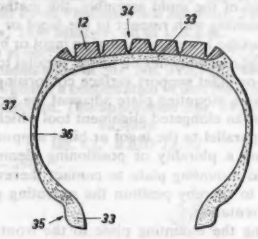


1. In combination with a wheel rim having seating surfaces for tire beads, and with a pneumatic vehicle tire with beads mounted on said rim: an annular inflatable body arranged within said tire and provided with reinforcing thread-shaped intercrossing members respectively ascending in left hand and right hand direction and respectively defining two superimposed layers embedded in said inflatable body, and arranged at least approximately symmetrically with regard to the circumferential direction of said tire, said inflatable body when in approximately non-inflated condition having an inner diameter which is greater than the diameter defined by the seating surfaces of said rim for the tire beads while said thread-shaped members of each of said superimposed layers in said approximately non-inflated condition define with the circumferential direction of said tire an angle of from 23° to 32° as to outer periphery entirely, said inflatable body when in inflated condition pressing the tire beads against the outer rim portions, the inflatable body at its outer diameter extending to the tire circumferential direction at such an angle that said outer diameter of said inflatable body will during the inflation of the latter practically be retained while its inner diameter will be reduced to such an extent that the inflatable body in inflated condition rests under pressure against said tire beads.

3,945,420
MOLDED ARTICLE FORMED OF FIBER REINFORCED MATERIAL

Werner Görter, Baden; Erich Kresta, Perchtoldsdorf, and Horst Stumpf, Baden, all of Austria, assignors to Semperit AG, Vienna, Austria

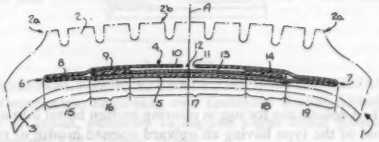
Division of Ser. No. 367,473, June 6, 1973, Pat. No. 3,901,961, which is a division of Ser. No. 167,768, July 30, 1971, Pat. No. 3,837,986. This application July 26, 1974, Ser. No. 492,029
Claims priority, application Austria, Aug. 5, 1970, 7107/70
Int. Cl.² B60C 9/02, 9/18
U.S. Cl. 152—357 A 13 Claims



1. A tire comprising at least one layer formed of an elastomeric material and essentially oriented fibers embedded in said elastomeric material, said tire layer including at least two sections containing such fibers, wherein said fibers of said sections, with said sections viewed projected into substantially a common plane, possess respective orientation directions differing from one another, and wherein said sections possess respectively different strength characteristics owing to the respective different fiber orientation directions of said two sections.

3,945,421
REINFORCEMENT PLY IN THE FORM OF A BELT FOR PNEUMATIC TIRES FOR VEHICLES

Dionysius Josef Poque, Aachen-Brand; Gerhard Franz-Josef Senger, Aachen, and Hans Jurgen Vogler, Herzogenrath-Merkstein, all of Germany, assignors to Uniroyal Aktiengesellschaft, Aachen, Germany

Filed Oct. 25, 1974, Ser. No. 518,024
Claims priority, application Germany, Nov. 6, 1973, 2355338
Int. Cl.² B60C 9/18
U.S. Cl. 152—361 FP 10 Claims

1. Reinforcements for a pneumatic tire for vehicles, comprising:

a first, inner belt ply;

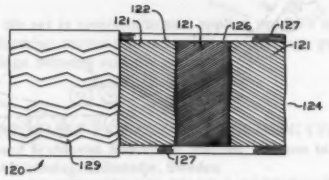
a pair of lateral strips connected to the free edges of the inner belt ply, said lateral strips and inner belt ply lying in substantially the same plane; and

a second, outer belt ply having a pair of opposed flanges which fold over and hem in the lateral strips and at least the marginal areas of the inner belt ply, and wherein the lateral strips are substantially spaced apart from the folded edges of the outer belt ply, so that the outer belt ply is superpositioned on itself in the areas between the folded edges of the outer belt ply and the free edge of the lateral strips, each superpositioned area of the outer belt comprising a width of at least 4% of the width of the tire, whereby the tire rigidity values decrease gradually from a maximum at the equatorial plane of the tire towards a minimum in the shoulder area of the tire.

3,945,422
TIRE WITH NO PLY STEER BELT

Marion G. Pottinger, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 8, 1975, Ser. No. 539,390
Int. Cl.² B60C 9/22
U.S. Cl. 152—361 DM 4 Claims



1. In a radial ply tire having a belt assembly with an odd number of plies of rubberized mutually parallel cords crossing the circumferential midplane of the tire at an acute angle, the improvement wherein the cords in each of the radially innermost and radially outermost plies of the belt assembly are oriented in the same direction relative to said circumferential midplane while the ply or plies intermediate the radially innermost and radially outermost plies are each characterized by a cord direction and stiffness which effects symmetrical stiffness relative to the thickness midplane of the belt.

3,945,423
METHOD FOR THE MANUFACTURE OF A COMPOUND CASTING

Christoph Hannig, Stuttgart, Germany, assignor to Mahle GmbH, Stuttgart, Germany

Filed Sept. 4, 1974, Ser. No. 503,134
Claims priority, application Germany, Sept. 6, 1973, 2344899
Int. Cl.² B22D 19/08
U.S. Cl. 164—75 4 Claims

1. A method for manufacturing a composite casting, comprising the steps of:

a. electrodepositing a layer of wear resistant material on to a core;

b. immersing said layer of wear resistant material in an aluminium containing melt to form an intermetallically combined aluminium layer;

c. casting an aluminium alloy around the aluminium layer in a pressureless manner to form a composite casting on said core; and

d. detaching said composite casting from said core, wherein during a final phase of the electro-depositing process, the current density is increased in such a way that the deposited layer has a roughened-up surface.

3,945,424
METHOD OF STRAIGHTENING A CONTINUOUSLY CAST STRAND

Irving Rossi, Dunros Farm, James St., Morristown, N.J. 07960

Filed Jan. 3, 1974, Ser. No. 430,576
Int. Cl.² B22D 11/124
U.S. Cl. 164—89 4 Claims

1. In the method for the continuous casting of steel strands of rectangular cross section in which the partially solidified strand emerging from a chill mold is curved and comprises

upper and lower curved surfaces of different radii, and in which said strand follows a curved path through a secondary cooling zone in which the strand is additionally solidified by the direct application of cooling water thereto, the step which consists of applying cooling water to that curved surface of the

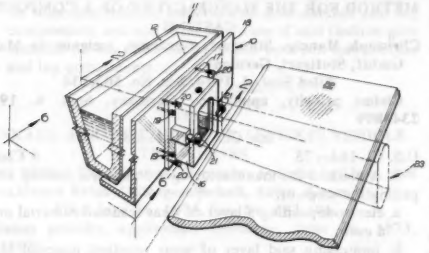
strand which is of greater radius at an intensity sufficient to reduce the surface temperature of the surface of greater radius below the surface temperature of the surface of lesser radius to produce a temperature differential between the said surfaces sufficient to straighten said strand.

3,945,425

MOLD ALIGNMENT DEVICE FOR HORIZONTAL CASTING

John J. Foye, Livermore, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Mar. 28, 1975, Ser. No. 563,277
Int. Cl.² B22D *11/14*, *33/04*
U.S. Cl. 164—137 **12 Claims**



6. In a continuous or semicontinuous horizontal casting apparatus comprising a molten metal reservoir, a vertically oriented front face, at least one open ended mold assembly supported by the front surface, conduit means to direct molten metal from the reservoir to the feed end of the mold assembly and an ingot or billet support surface positioned in front of the discharge end of the mold assembly, the improvement in the means for aligning of the mold with respect to the pass line of the support surface comprising

a. a mounting plate provided with adjustable positioning means which are adapted to contact the front face and maintain the mounting plate in a desired orientation and provided with means to attach the mounting plate to the front surface,

b. an elongated alignment tool having associated with the operative end thereof means to receive and support the mounting plate and to maintain said mounting plate in a desired position with respect to the alignment tool, the alignment tool adapted to be positioned on the support surface and thereby align the mounting plate with respect to the passs line of the support surface, and

c. means associated with the mounting plate to position and affix an open ended mold assembly thereto to align the mold so that the lowest portion of the ingot or billet emerging from the mold lies on and is parallel to the pass line of the support surface.

11. In a horizontal continuous or semicontinuous casting apparatus comprising a molten metal reservoir, a vertically oriented front surface, at least one open ended mold assembly supported by the front surface, a conduit adapted to direct molten metal from the reservoir to the feed end of the mold assembly and an ingot or billet support surface adjacent the discharge end of the mold assembly, the method of aligning the mold assembly with respect to the ingot or billet support surface so that the lowest surface of an ingot or billet emerging from the mold assembly lies on and is parallel to the pass line of the ingot or billet support surface comprising

a. disposing a mounting plate adjacent the front surface by means of an elongated alignment tool which is supported by and parallel to the ingot or billet support surface,

b. adjusting a plurality of positioning elements provided with said mounting plate to contact therewith the front surface to thereby position the mounting plate in a desired orientation,

c. attaching the mounting plate to the front face without changing the position of the mounting plate,

d. withdrawing the alignment tool, and

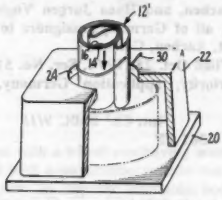
e. attaching an open ended mold assembly to the mounting plate.

3,945,426

SPLASH CAN FOR INGOT MOLDS AND METHODS

Andrew Walker, Upland; Charles Frederick Long, Rialto, and Harry Davies Birks, Cherry Valley, all of Calif., assignors to Kaiser Steel Corporation, Oakland, Calif.

Filed Dec. 19, 1974, Ser. No. 534,175
Int. Cl.² B22D *7/12*
U.S. Cl. 164—137 **8 Claims**



1. A splash can for use in pouring molten metal into an ingot mold of the type having an upward opened mouth of reduced diameter to receive molten metal, said mold defining a cavity having an interior periphery C, said splash can comprising a strip of metal material compatible with the molten metal, said strip being of substantially rectangular shape and having two opposed edges, means for joining said two opposed edges of said strip to form a cylinder comprised of a closed loop and having a diameter greater than the mold mouth and not substantially greater than C/π, said strip being resiliently coiled upon itself into a folded condition defining a double walled helix capable of resiliently returning to the original shape of the cylinder, said strip when in the folded condition being of a size suitable for introduction into said mold through said mouth, and means releasably retaining said cylinder in said folded condition.

3,945,427

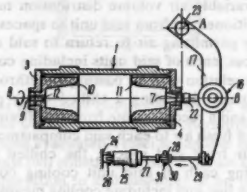
INSTALLATION FOR PRODUCING BIMETALLIC SOLID BODIES OF CYLINDRICAL SHAPE

Boris Samoilovich Milman, Sharikopodshipnikovskaya ulitsa, 2, kv. 89; Genrikh Sergeevich Mirzoian, ulitsa Flotskaya, 7, korpus 5, kv. 809; Gennady Sergeevich Strizhov, Uohebny porculok, 2, kv. 101; Viktor Gurievich Tinyakov, I Juzhnoportovy prodva, 16/39, kv. 23, all of Moscow; Pavel Petrovich Doroschenko, prospekt Lenine, 122, kv. 16, Lutugino, Voroshilovgradskaya oblast; Vladimir Evgenievich Karsky, ulitsa Krasnykh partizan, 2, Lutugino, Voroehflovgradskaya oblast; Moisei Markovich Levin, Sharikopodshipnikovskaya ulitsa, 2, kv. 4, Moscow; Viktor Mikhailovich Krapukhin, Suvorovsky bulvar, 15, kv. 13, Moscow, and Pavel Vladimirovich Semenov, 3 Frunzenskaya ulitsa, 9, kv. 155, Moscow, all of U.S.S.R.

Continuation of Ser. No. 397,411, Sept. 14, 1973, abandoned, which is a continuation of Ser. No. 310,795, Nov. 30, 1972, abandoned, which is a continuation of Ser. No. 153,932, June 17, 1971, abandoned. This application Apr. 19, 1974, Ser. No. 463,046

Int. Cl.² B22D *13/02*

U.S. Cl. 164—298 **3 Claims**



1. An installation for producing cylindrical-shaped bimetallic solid bodies, comprising: a casting mould adapted to rotate about a horizontal axis and having at one end an inlet hole with tapered walls in its outer portion serving to pour metal therethrough, and at the other end an exhaust hole to let out gas during metal pouring; a runner means with an outlet end whose shape is congruent with the shape of said tapered walls, said runner means being mounted on a base adapted to displace said outlet end of said runner means along said horizontal axis of rotation of said casting mould and to tightly press said outlet end of said runner means against said tapered walls of said inlet hole of said casting mould, said base, on which said runner means is mounted, is made to pivot in the horizontal plane, the axis of said base pivoting being intersected by a perpendicular erected from a point on the rotation axis of said casting mould, which point is located in the middle of that section of said inlet hole of said mould where said tapered walls of said inlet hole contact said outlet end of said runner means.

3,945,428

DIE ASSEMBLY FOR SQUEEZE CASTING OF METALS

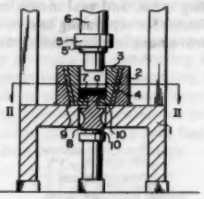
Ikuo Yanagisawa, Shizuoka, and Toshiyuki Kawai, Shimizu, both of Japan, assignors to Nippon Light Metal Research Laboratory Ltd., Tokyo, Japan

Filed June 24, 1974, Ser. No. 482,561

Int. Cl.² B22D *17/12*; **B41B** *11/54*

U.S. Cl. 164—319 **5 Claims**

1. In a squeeze casting apparatus for metals wherein a molten metal is poured into a forming die provided on a base, the die is sealed, and the metal is solidified while pressure is applied thereto in a generally vertical direction, the improvement wherein said forming die is a die assembly comprising a tubular reinforcing metal mold set on a base said tubular reinforcing mold having a downwardly tapering inner bore; and a forming die disposed within the bore of said mold and having its exterior surfaces extending in mating tapering relation to said tapered bore wall, said forming die being formed of at least two sections joined together along generally vertical abutting surfaces and defining therewithin a die cavity for said molten metal, whereby said mating tapering surfaces on said



mold and die act in response to said applied pressure to urge said die forming sections into intimate contact to prevent metal spillage between said die sections.

3,945,429

DECOMPOSABLE PASSAGE-WAY FORMING CORE

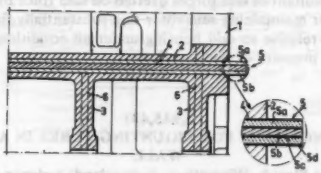
Hans Sigvard Wahlqvist, Sodertalje, Sweden, assignor to Saab-Scania Aktiebolag, Sodertalje, Sweden

Division of Ser. No. 232,706, March 8, 1972, Pat. No. 3,805,874. This application Mar. 5, 1974, Ser. No. 448,357

Claims priority, application Sweden, Mar. 15, 1971, 3270/71

Int. Cl.² B22C *9/10*

U.S. Cl. 164—369 **9 Claims**



1. A decomposable, passage-way forming core for use in a mold during the molding of molten material comprising: a separate preformed tube of powdered or granulated refractory material held together by an organic binding agent which is thermally decomposable at a temperature below the melting point of the molten material being molded and which gives off little gas when thermally decomposed; and an elongated reinforcing member disposed within the bore of said tube in contact therewith so as to support said tube during the molding operation and be removable from said tube upon completion of the molding operation, said elongated reinforcing member forming with the bore of the tube at least one longitudinally extending vent.

3,945,430

ROTARY REGENERATIVE HEAT-EXCHANGER

Henricus Cornelis Johannes van Beukering, Eindhoven, Netherlands, and Albertus Peter Johannes Michels, Briarcliff Manor, N.Y., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 20, 1975, Ser. No. 542,352

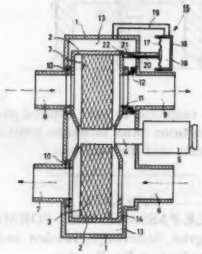
Claims priority, application Netherlands, Feb. 15, 1974, 742075

Int. Cl.² F28D *19/00*

U.S. Cl. 165—9 **6 Claims**

1. In a rotary regenerative heat-exchanger operable with cold and hot gas flows which have mutually different variable pressures and velocities, and including a stationary rotor housing having first and second inlets for receiving said cold and hot gas flows respectively and corresponding outlets, a rotor

mounted in said housing and containing a regenerative filling mass with gas flow passages therethrough for axial counter flow of said cold and hot gas flows which exert mutually opposed, variable axial forces on said rotor due to flow resistance of said filling mass, and seal means mounted between said housing and rotor for separating said two gas flows therethrough, the improvement in combination therewith comprising at least one control means which is operable in response to said variable pressure of one of said gas flows, and which exerts an axial force on said rotor which force is proportional to the resultant of said forces exerted on said rotor by said gas flows, for maintaining said rotor in a substantially fixed axial position relative to said housing under all conditions of said variable pressure of said gas flows.



3,945,431

ARRANGEMENT FOR MOUNTING TUBES IN A TANK WALL

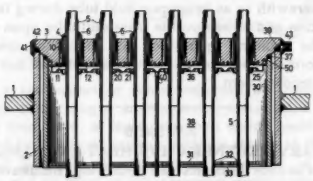
Hermann Straub, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Nov. 12, 1973, Ser. No. 415,107

Claims priority, application Switzerland, Nov. 28, 1972, 17278/72

Int. Cl.[2] F28F 9/04

U.S. Cl. 165—11 7 Claims



1. The combination of a tank wall, a tube base connected in gas-tight relation to said tank wall, a thin sheet-metal membrane peripherally connected with said tube base in gas-tight manner to define an enclosed gas-tight chamber therebetween, a set of tubes extending through said tube base, said chamber and said membrane and being connected to said tube base and said membrane in gas-tight relation, a cylinder mounted on said tube base in surrounding relation to said tubes and a plate secured to said cylinder, said plate having apertures for guiding said tubes therethrough.

3,945,432

AIR CONDITIONING METHOD AND SYSTEM

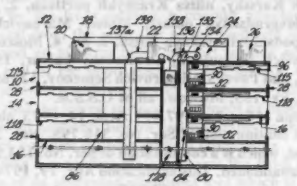
Robert Teudar Tamblyn, Littlebrook Farm, R.R. No. 2, Gormley, Ontario, Canada

Continuation of Ser. No. 237,413, March 23, 1972, abandoned. This application Sept. 6, 1974, Ser. No. 504,672

Claims priority, application Canada, Feb. 10, 1972, 134438

Int. Cl.[2] F24F 3/00

U.S. Cl. 165—22 19 Claims



1. In a system for air conditioning a multi-storey building having an air handling unit in a compartment on a floor to be conditioned, variable air volume distribution means for distributing conditioned air from said unit to spaces on said floor and means for permitting air to return to said compartment from said spaces, each of said units including cooling coils in heat-exchange relation with air passing therethrough, fresh air conditioning means including a chilled water piping circuit with a precoil and a recoil remote from said floors and providing conditioned fresh air to each said compartment for mixing with return air from said spaces, the chilled water piping circuit including each of said unit cooling coils feeding a common return line and including cooling means remote from said floors and said precoil and recoil, and thermostatic control means responsive to the temperature of chilled water in said common return line for controlling the cooling capacity of said cooling means, thereby maintaining a predetermined difference between the temperature of the chilled water in said common return line and the temperature of air off said unit cooling coils.

3,945,433

VACUUM VAPORIZATION APPARATUS FOR HEATING ONE OR A NUMBER OF SEPARATE LIQUIDS

Zdenek Koula, Regensdorf, Switzerland, assignor to Stotz & Co., Zurich, Switzerland

Filed Oct. 2, 1972, Ser. No. 294,009

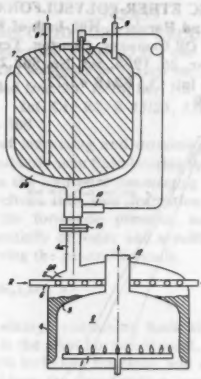
Claims priority, application Germany, Oct. 6, 1971, 2149884; Oct. 6, 1971, 2149885

Int. Cl.[2] A47J 27/16; F24D 3/08

U.S. Cl. 165—39 8 Claims

1. A fluid heater apparatus working according to the vacuum vaporization principle and serving for heating one or a number of fluid mediums which are separated from one another, comprising an evacuated vessel at least partially filled with a vaporizable heating liquid medium, said evacuated vessel including at least two components constructionally separated from each other, a heat exchanger arranged at the evacuated vessel for each fluid medium to be heated, each heat exchanger being practically exclusively heated by the vapor or the vaporizable heating liquid medium, at least one heat exchanger defining one of said at least two constructionally separate components of said evacuated vessel, said at least one heat exchanger comprising a hot water heater, another component of said at least two components of said evacuated vessel defining a heating component, and means for removably connecting said at least two components of the evacuated vessel, said connecting means comprising a connection conduit having a cross-section substantially smaller than the cross-section of either of said two components, said connection conduit flow connecting separate components of said evacuated vessel, said connection conduit further being con-

structed and arranged to transmit the vapor of the vaporizable heating liquid medium in countercurrent flow with the condensate of the vaporizable heating liquid medium in such a manner that the return flow of the condensate from said at



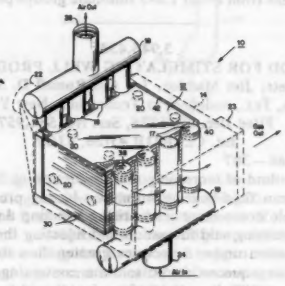
least one heat exchanger component to said heating component can occur without hindering the operation of the apparatus whereby said evacuated vessel is capable of being divided into said at least two constructionally separate components for ease of transportation to and assembly at an installation site.

3,945,434

GAS TURBINE HEAT EXCHANGER APPARATUS

Kenneth O. Parker, Rolling Hills Estates, and Clarence L. Marksberry, Encinitas, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Sept. 30, 1974, Ser. No. 510,344
Int. Cl.² F28F *3/06*
U.S. Cl. 165—166 **5 Claims**



1. A counterflow heat exchanger of the type including a core of substantially parallel stacked plates and a plurality of manifolds in parallel spaced relation to each other, said manifolds and said defining a gas inlet surface for receiving hot gases and directing said gases into alternate spaces between said plates and temperature controller means, the improvement wherein said temperature controller means comprises:

a body having an inlet side and an outlet side and including a plurality of plate members defining a plurality of gas passages communicating said inlet side and said outlet side, said inlet side being arranged for receiving said hot gases and said outlet side being in close proximity to said gas inlet surface;

first ones of said passages being arranged for conducting a portion of the hot gases to said stacked plates of said heat exchanger and including means reducing the temperature of the hot gases before such gases reach said stacked plates of said heat exchanger, and

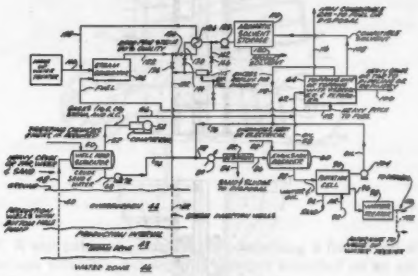
second ones of said passages bypassing said first passages and being arranged for conducting the remainder of said hot gases into heat transmitting relationship with said manifolds so that hot gases from said second passages which heat said manifolds are at a higher temperature than the gases leaving said first passages during transient heat exchange conditions.

3,945,435

IN SITU RECOVERY OF HYDROCARBONS FROM TAR SANDS

Charles B. Barry, Houston, Tex., assignor to The Ralph M. Parsons Co., Pasadena, Calif.

Division of Ser. No. 363,596, May 24, 1973, Pat. No. 3,881,550. This application Nov. 7, 1974, Ser. No. 521,553
Int. Cl.² E21B *43/16*
U.S. Cl. 166—267 **7 Claims**



1. In a process for the recovery of hydrocarbons from subterranean deposits of hydrocarbons having high viscosities and including tar sands, oil and tar deposits by injected fluid stimulation of the deposit, the improvement which comprises:

a. cyclically injecting into the deposit in at least one injection well;

i. a solvent stimulant of high aromatic content produced from the recovered hydrocarbon, the solvent being introduced at a temperature from about 200° to about 650° F and

ii. a steam stimulant;

b. recovering stimulated hydrocarbon from the deposit at at least one product well; and

c. producing solvent from the recovered hydrocarbon in an area proximate the area of hydrocarbon recovery for cyclic injection into the deposit.

3,945,436

METHOD AND APPARATUS FOR CLEANSING WELL LINER AND ADJACENT FORMATIONS

Rostislav Nebolsine, 64 E. 86th St., New York, N.Y. 10028

Filed Jan. 7, 1975, Ser. No. 539,111
Int. Cl.² E21B *33/124, 33/127, 43/24, 43/27*
U.S. Cl. 166—303 **7 Claims**

1. A method for cleansing well liners or the walls of an open cavity, and the adjacent underground formations, comprising the steps of:

sealing a first length of the liner or cavity walls and a second length of the liner or cavity walls spaced from and positioned below the first length against fluid flow;

first injecting a first fluid such as an acid, detergent, demulsifier or caustic fluid through the liner or cavity walls between the first and second sealed lengths and into the

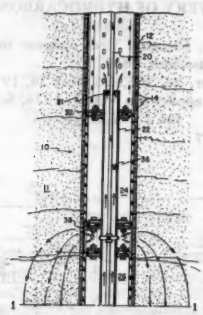
adjacent underground formation in order to cleanse the underground formation;

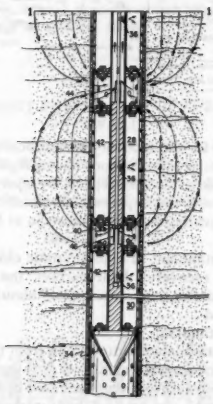
then injecting a second fluid such as water, steam or oil through the liner or cavity walls between the first and second sealed lengths and into the underground formation in order to entrain the loosened or dissolved particles in the underground formation and then recovering the entrained fluid from the underground formation through the liner or cavity walls below the second sealed length.

3. Apparatus for cleansing well liners having apertures or the walls of an open cavity, and the adjacent underground formations, comprising:

a first pipe adapted to be positioned within a well;

a second pipe positioned within said first pipe;





a pressurized cleansing fluid source and a pressurized entraining fluid source, and means for connecting said fluid sources to said second pipe;

a first elongated packer surrounding said first pipe;

a second elongated packer surrounding said first pipe, said second packer being positioned vertically below and spaced from said first packer, the length of said first and second packers being in the range of two to five times the diameter of the well liner or open cavity within which said packers are to be positioned so that the sealed lengths of the liner or cavity are sufficiently long to cause the cleansing fluid and the entraining fluid to flow outwardly through the underground formation in arc-shaped paths at a distance away from the liner or cavity;

a fluid outlet port communicating with said second pipe and extending through said first pipe, said outlet port being positioned between said first and second packers;

a fluid inlet port communicating with said first pipe and being positioned below said second packer.

3,945,437

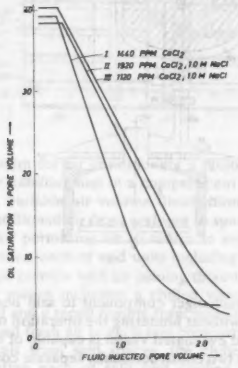
PROCESS FOR DISPLACING OIL USING AQUEOUS ANIONIC SURFACTANT SYSTEMS CONTAINING AROMATIC ETHER POLYSULFONATES

Ying-Chech Chiu, and Harold J. Hill, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 26, 1975, Ser. No. 562,283

Int. Cl.² E21B *43/22*

U.S. Cl. 166—305 R **10 Claims**



1. In a process in which an aqueous anionic surfactant system is injected into a relatively remotely located oil-containing permeable medium to displace oil within the medium, the improvement comprising:

injecting an aqueous anionic surfactant system that contains a proportion of aromatic ether polysulfonate that improves the salt tolerance of the system without significantly reducing the interfacial tension-lowering activity of the system, said aromatic ether polysulfonate being a preferentially water-soluble compound that contains one ether group attached to at least one aromatic radial and contains from about 1.8–2 sulfonate groups per molecule.

3,945,438

METHOD FOR STIMULATING WELL PRODUCTION

Jack F. Tate; Jim Maddox, Jr., and Russell D. Shupe, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,957

Int. Cl.² E21B *43/26, 43/27*

U.S. Cl. 166—307 **11 Claims**

1. A method of increasing the production of fluids from a subterranean fluid-bearing formation having present therein acid-soluble components comprising injecting down the well bore penetrating said formation and injecting therefrom into said formation under a pressure greater than the formation pressure, an aqueous acidic solution containing from about 0.5 to about 28% by weight of a mineral acid having a compound therein in an amount of from about 0.005 to about 2% by weight, said compound being a water soluble sulfonated, ethoxylated compound having the general formula

$$R(OCH_2CH_2)_nSO_3^- A^+$$

wherein R is alkaryl, containing from about 6 to 18 carbon atoms in the alkyl portion thereof, *n* is a number from one to about 10, including fractions, and A^+ is a monovalent cation selected from the group sodium, potassium, and ammonium, including mixtures, maintaining said solution in contact with the formation and production equipment for a time sufficient for the acid component to chemically react with the acid-soluble components of the formation to etch passageways there-

through thereby increasing substantially the flow capacity of the said subterranean formation and whereby said sulfonated, ethoxylated compound component is effective to prevent the formation of insoluble calcium compounds or the precipitation of calcium carbonate from the acid-spent solution.

3,945,439
METHOD FOR OIL RECOVERY

Russell D. Shupe; Jim Maddox, Jr., and Jack F. Tate, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,983
Int. Cl.² E21B *43/25, 43/26*
U.S. Cl. 166—308 **8 Claims**

1. Method of increasing and sustaining the production of fluids from a subterranean fluid-bearing formation comprising injecting down the well bore penetrating said formation and injecting therefrom into said formation under a pressure greater than the formation pressure, an aqueous solution consisting essentially of water and a sulfonated, ethoxylated compound having the general formula:

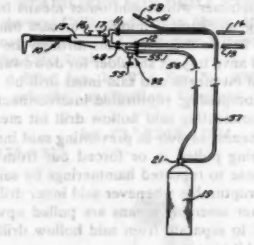
$$R(OCH_2CH_2)_nSO_3^-A^+$$

wherein R is alkaryl, containing from about 6 to about 18 carbon atoms in the alkyl portion thereof, *n* is a number from one to about 10 including fractions, and A^+ is a monovalent cation selected from the group sodium, potassium, and ammonium, including mixtures.

3,945,440
FIRE EXTINGUISHING APPARATUS FOR OXY-ACETYLENE WELDING ASSEMBLIES

August Edward Bohme, 5759 Larson Place, West Vancouver, British Columbia, Canada

Filed June 23, 1975, Ser. No. 589,710
Int. Cl.² F23D *13/46;* **A62C** *13/00*
U.S. Cl. 169—54 **4 Claims**



1. Fire extinguishing apparatus for oxy-acetylene assemblies having a welding torch provided with couplings for connection to pressurized lines extendable from a source of oxygen and acetylene and provided with manually operative shut-off valves for controlling the issuance of oxygen and acetylene therefrom and a pressurized bottle of fire extinguishing fluid having a valve assembly provided with a discharge port and a release actuator for releasing the extinguishing fluid through the port, said apparatus including:

a. a cylinder connectable at one end to a bottle of fire extinguishing fluid over the actuator therein and connectable at its opposite end to a return oxygen line,

b. a piston freely slidable within the cylinder adapted to be moved into operative engagement with the actuator of the bottle,

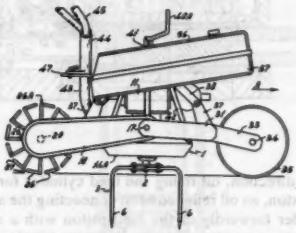
c. a valve assembly connectable between the oxygen line from the oxygen bottle and the welding torch the valve assembly having a main passage for enabling the passage of oxygen to the torch and an intersecting passage intersecting at one end, the through passage and having at its opposite end means for coupling to the return oxygen line and a normally closed manually operated valve in the intersecting passage adapted when open to release pressurized oxygen through the oxygen return line so as to move the piston into operating engagement with the actuator to enable discharge of the extinguishing fluid from the pressurized bottle of fire extinguishing fluid,

d. a discharge line connectable at one end of the discharge port of the extinguishing fluid bottle so as to enable discharge of the extinguishing fluid at a point remote from the fire extinguishing bottle.

3,945,441
SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland, and Ary van der Lely, 10, Weverskade, Maasland, Netherlands

Filed June 19, 1973, Ser. No. 371,476
Claims priority, application Netherlands, June 23, 1972, 7208616
Int. Cl.² A01B *33/00*
U.S. Cl. 172—43 **5 Claims**



1. A soil cultivating implement comprising a frame and at least one rotatable soil-working member mounted on an upwardly extending shaft supported by said frame, said implement having driving means connected to said shaft and said soil-working member to rotate same about a substantially vertical axis during operation, a ground engaging elongated roller member connected to said frame, said roller member having a substantially horizontal driven rotary shaft and a periphery comprised of a plurality of elongated rod-like resilient elements which extend in the general direction of the axis of rotation, said roller member extending transverse to the normal direction of travel at the rear of said frame to support the implement, said driving means being interconnected to said driven shaft to rotate said roller member and propel the implement, an engine being mounted on said frame in driving connection with said driving means, said engine being positioned directly above said soil-working member on top of said frame, said roller member being pivotally connected to said frame through adjusting arm means that raises and lowers said frame relative to the ground, said adjusting means comprising two arms supporting the ends of said horizontal shaft and at least one of said arms forming a driving connection for said roller.

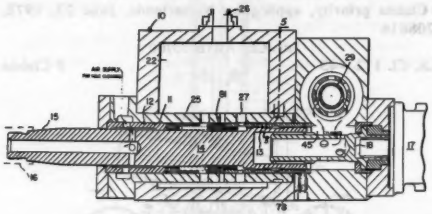
3,945,442
HYDRAULIC ROCK DRILL WITH STROKE RESPONSIVE ADVANCE

Lester A. Amtsberg, Utica, N.Y., assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Oct. 7, 1974, Ser. No. 512,506
Int. Cl.² E21C *5/10*
U.S. Cl. 173—10 **3 Claims**

1. An hydraulic rock drill comprising a main piston cylinder, a power piston hydraulically reciprocable in the cylinder having an externally projecting rod portion carrying a drill string with a rock bit, control valve means for causing effec-

tive application of hydraulic driving fluid alternately to forward and rear ends of the piston to reciprocate the latter, the piston adapted upon a return stroke to draw the rock bit away from the work a predetermined distance and adapted upon a work stroke to carry the rock bit forwardly over an initial lost motion distance before engaging the rock bit with the work; characterized by hydraulically operable feed means effective upon completion of said lost motion action to advance the rock drill concurrently with the rock bit relative to the work, the feed means comprising a slide carriage supporting the rock drill upon a guide channel, a carriage feed piston operable in a feed cylinder and having a piston rod connection with the carriage, pressurized oil in the feed cylinder rearwardly of the feed piston constantly urging the feed piston in a carriage



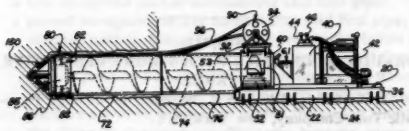
advancing direction, oil filling the feed cylinder forwardly of the feed piston, an oil relief conduit connecting the area of the feed cylinder forwardly of the feed piston with a relief port opening into a rear area of the main piston cylinder, the relief port adapted to be covered over by the power piston in a returned position of the latter whereby relief of oil from the feed cylinder forwardly of the feed piston is blocked so as to disable forward movement of the feed piston and consequent advance of the carriage, and the relief port being adapted to be uncovered by the power piston following a predetermined degree of lost motion movement of the power piston on a work stroke so as to cause relief of the oil forwardly of the feed piston and enable the feed piston to advance the carriage concurrently with further movement of the power piston on a work stroke.

3,945,443

STEERABLE ROCK BORING HEAD FOR EARTH BORING MACHINES

Thomas W. Barnes, Franklin, Ohio, assignor to The Richmond Manufacturing Company, Ashland, Ohio

Filed Aug. 14, 1974, Ser. No. 497,245
Int. Cl.² E21B *7/08*
U.S. Cl. 175—73 **6 Claims**



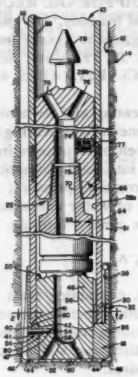
2. The apparatus defined in claim 1 wherein said wedging means comprises separate wedging apparatus spaced circumferentially around said lead casing section.

3,945,444

SPLIT BIT CASING DRILL

Gary L. Knudson, Butte, Mont., assignor to The Anaconda Company, New York, N.Y.

Filed Apr. 1, 1975, Ser. No. 564,133
Int. Cl.² E21B *1/06, 3/12, 5/00*
U.S. Cl. 175—92 **5 Claims**



1. In an apparatus adapted for drilling and casing earth formations, earth structures, or the like comprising a rotatable and axially movable tubular outer means having a drilling end, hollow drill bit means connected adjacent said drilling end and conjointly rotatable with said outer means and having an anvil impact shoulder in the interior of said hollow drill bit means, rotatable inner drill bit means generally centrally disposed within said outer means for drilling the earth formation and having a percussion shoulder for contacting said anvil shoulder, hammer assembly means including a selectively reciprocally movable hammer within said outer means for intermittently impacting mechanical impulses to said inner drill bit means and said hollow drill bit means through the percussion shoulder to said anvil impact shoulder for downwardly driving said hollow drill bit means and said inner drill bit means, the improvement comprising, rupturable interconnection means rotatably interconnecting said hollow drill bit means to said inner drill bit means, as well as preventing said inner drill bit means from being pulled in or forced out from said outer means in response to repeated hammerings by said hammer, and also being rupturable whenever said inner drill bit means and said hammer assembly means are pulled upwardly with force sufficient to separate from said hollow drill bit means said inner drill bit means.

3,945,445

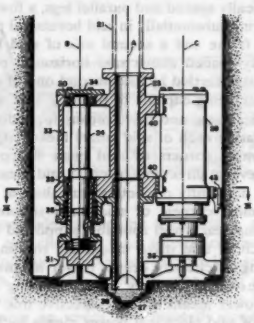
BORING APPARATUS PROVIDED WITH DRILL BITS FREELY ROTATABLE AROUND THEIR OWN AXIS

Nobuhisa Ikeda, Yokohama, Japan, assignor to Tone Boring Company Limited, Tokyo, Japan

Filed Oct. 4, 1974, Ser. No. 512,067
Claims priority, application Japan, Oct. 15, 1973, 48-115482; Dec. 11, 1973, 48-140116; Dec. 20, 1973, 48-143225
Int. Cl.² E21B *3/08*
U.S. Cl. 175—319 **14 Claims**

1. A boring apparatus for boring holes in the ground comprising a plurality of downward extending drill bits and associated drill bit shafts, and a boring pipe, each said drill bit shaft and said boring pipe being rotatably supported in a casing assembly, each said drill bit shaft being rotatably journaled in an associated means for supporting each said drill bit shaft such that each said drill bit is freely rotatable about the axis of rotation of said associated drill bit shaft, said means arranged and configured such that the axis of rotation of each

said drill bit shaft is substantially parallel to the axis of rotation of said boring pipe, said means for supporting each said drill bit shaft being coupled to said boring pipe, such that said means is non-rotatable about its own axis, said means being further characterized by an absence of any gear engaging member for engaging said boring pipe disposed along the outer periphery thereof, said boring pipe being disposed in said casing assembly such that said drill bit shafts circumferentially surround said boring pipe, said boring pipe being further



characterized by a lack of any gear engaging members for engaging said means for supporting said drill bit shaft, said casing assembly coupling said boring pipe to each said drill bit shaft such that rotation of said casing assembly causes (i) said boring pipe to axially rotate; (ii) said means for supporting each said drill bit shaft to revolve about said axis of said boring pipe; and (iii) each said drill bit shaft and drill bit to rotate about said axis of said drill bit shaft in a direction of rotation opposite to the direction of rotation of said boring pipe.

3,945,446

STABILIZER FOR DRILL STRINGS

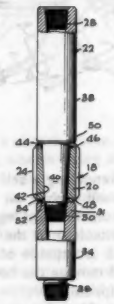
Alfred Ostertag, Celle, and Claus Marx, Hannover, both of Germany, assignors to Christensen Diamond Products Co., Salt Lake City, Utah

Filed Jan. 2, 1974, Ser. No. 430,077

Claims priority, application Germany, Mar. 8, 1973, 2311359

Int. Cl.² E21B *17/04*

U.S. Cl. 175—323 **11 Claims**



1. A rotary drill string stabilizer apparatus for use in rotary drilling of a bore hole: a body structure having connecting means adapted to secure such structure in a tubular running string, said body structure including a body member having a conical outer surface and a passage therethrough through which drilling fluid from the tubular running string can flow, a stabilizer comprising a stabilizer sleeve having a conical inner surface matching the conical configuration of said conical outer surface of said body member, said stabilizer sleeve being mounted on said body member with said conical outer and inner surfaces in friction contact, said stabilizer sleeve having an effective outside diameter conforming to the diameter of the bore hole, said sleeve having a plurality of longitudinal passages for the longitudinal flow of drilling fluid therethrough, longitudinally spaced peripheral seals preventing fluid leakage between said inner and outer surface from the region between said seals, and means for conducting fluid under pressure to the region between said conical inner surface and conical outer surface and between said seals to expand said sleeve and enable said sleeve to be moved relatively longitudinally along said conical outer surface to shrink-fit said sleeve on said body member upon relieving of the fluid pressure.

3,945,447

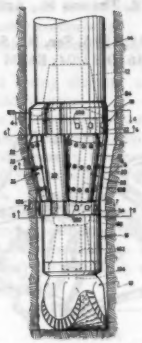
BORING APPARATUS

Carl R. Peterson, Boxford, Mass., assignor to Rapidex, Inc., Gloucester, Mass.

Filed Sept. 16, 1974, Ser. No. 506,021

Int. Cl.² E21B *9/24*

U.S. Cl. 175—349 **14 Claims**



1. In boring apparatus of the type having a plurality of cutters mounted for rotation about respective cutter axes in a frame which is in turn rotatable about a frame axis, each said cutter having a body carrying teeth which in operation sweep and cut into a surface which is oblique to the axis of advance of said apparatus, that improvement wherein each said cutter has a plurality of selected tooth regions spaced along the respective said cutter axis, said tooth regions of said plurality of cutters are arranged in an ordered cycle progressing along said frame axis, and regions adjacent each other in said cycle are on different cutters and overlap each other along said frame axis, said regions, taken in order in said cycle, having alternately high and low effective tooth densities to counteract the tendency of teeth of one said region to track the chip spaces left by teeth of the previous said region.

3,945,448

SYSTEM FOR PACKAGE WEIGHT CONTROL

Kenneth W. Sellers, Dallas, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

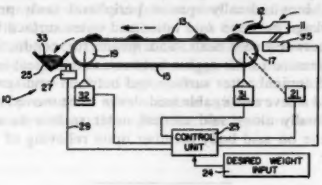
Filed July 18, 1974, Ser. No. 489,605

Int. Cl.² G01G *19/04, 13/02*

U.S. Cl. 177—25 **5 Claims**

1. A package weight control system comprising a material charge receiving means, a conveyor means for dispensing

material into said charge receiving means, means for sequentially dispensing material onto said conveyor means in unit amounts, means for determining the weight of each unit amount of material on said conveyor means and for storing the determined weight of each unit amount of material on said conveyor means, means for determining the weight of material



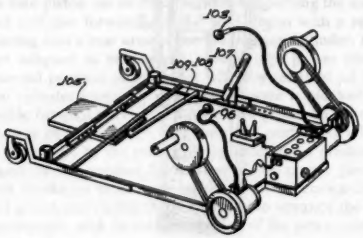
required to provide a charge in said charge receiving means of a predetermined total weight, and means for advancing said conveyor means to dispense into said charge receiving means a number of unit amounts of material having a combined weight sufficient to bring the weight of the charge in said charge receiving means up to the predetermined total weight.

3,945,449

WHEELED ATTACHMENT FOR A CHAIR

Henry J. Ostrow, 218 E. Thomas St., Arlington Heights, Ill. 60004

Filed Jan. 31, 1975, Ser. No. 546,102
Int. Cl.² B62D *11/04*; B62M *1/14*
U.S. Cl. 180—6.5 **17 Claims**



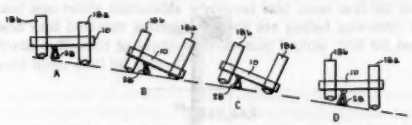
10. A wheeled attachment for converting a chair having leg means into mobile means for transporting nonambulatory persons, comprising, a generally rectangularly shaped chair support frame having a pair of transversely spaced and parallel, longitudinally extending side sill members, a transversely extending rear sill member longitudinally spaced and parallel with respect to said front sill member, one end of each side sill member being rigidly connected to a respective end of said front sill member and its opposite end rigidly connected to a respective end of said rear sill member; chair leg supporting and securing means at each corner of said chair support frame, each of said chair leg supporting and securing means being operatively connectible to a respective leg means of a chair, each of said chair leg supporting and securing means at each corner of said chair support frame including a generally flat mounting plate for supporting a respective one of the chair leg means, socket means carried by said mounting plate for receiving said respective one of said chair leg means, means for detachably securing said respective one of said chair leg means in said socket means, and means for adjustably securing said mounting plate to a respective one of said front and rear sill members at any one of a plurality of positions along the length thereof, said mounting plate being substantially horizontally disposed when in use; means for individually adjusting the length of each of said front, rear, and side sill members; ground-engaging wheel means at each corner of said chair support frame for supporting said chair support frame in a generally horizontal plane, the rotational axes of said wheel means being vertically spaced above said generally horizontal plane of said generally horizontal plane of said chair support frame, each of said ground-engaging wheel means at each of the two forwardmost corners of said chair support frame including a bracket integrally formed with a respective one of said side sill members and extending longitudinally forwardly therefrom, said brackets being substantially Z-shaped in side elevation so as to provide a pair of substantially horizontally disposed, vertically spaced and parallel legs, a first one of said bracket legs lying substantially in said horizontal plane of said chair support frame and a second one of said bracket legs being vertically spaced above said horizontal plane, and a swivel-type caster carried by said second one of said bracket legs, said caster being capable of pivoting 360° about a substantially vertical axis; and drive means for individually and selectively rotating each of said wheel means at each of the two rearwardmost corners of said chair support frame in forward and reverse directions, each of said means including a transversely outwardly projecting stub shaft at each of the two rearwardmost corners of said chair support frame, a ground-engaging rear wheel rotatably supported on said stub shaft, and each of said drive means for rotating each rear wheel including electrically driven power means and power transmission means operatively interconnecting said electrically driven power means and a respective one of said rear wheels, each of said electrical power means including, a reversible electric motor-speed reducer unit mounted on said rear sill member at a respective end thereof, and said power transmission means including a driven gear fixed to the interiorly facing side of a respective one of said rear wheels, and a drive pinion gear in meshing engagement with said driven gear, said drive pinion gear being drivingly connected to the output shaft of said electric motor-speed reducer unit.

3,945,450

APPARATUS AND METHOD FOR RENDERING AN OFFSHORE DRILLING PLATFORM SELF MOBILE

Clyde H. Wilson; Donald M. Cross; James A. Dupuy, all of Vicksburg, Miss., and Duel J. Tarrant, Houston, Tex., assignors to Marathon-LeTourneau Company, Vicksburg, Miss.

Filed Feb. 10, 1975, Ser. No. 548,238
Int. Cl.² B62D *57/02*
U.S. Cl. 180—8 R **9 Claims**



1. An apparatus for rendering a self elevating, mobile offshore drilling platform self mobile on land, the platform including a body, at least one forward leg attached to the body, at least one rear leg attached to the body, and means for adjusting the legs which is capable of moving the legs with respect to the body and moving the body with respect to the legs; the apparatus comprising:

a launch pad capable of bearing a portion of the weight of the platform and

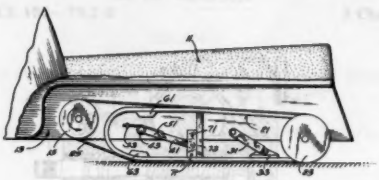
mean for pivotally mounting said launch pad to the body of the platform, said mounting means being positioned to enable the mounted launch paid to swing freely beneath the body and to locate the center of gravity of the platform between the forward leg and the mounted launch pad.

3,945,451

SNOWMOBILE TRACK SUSPENSION WITH VARIABLE LOAD TRANSFER CHARACTERISTICS

Olav Aaen, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 9, 1974, Ser. No. 530,652
Int. Cl.² B62D 55/10
U.S. Cl. 180—9.52 9 Claims



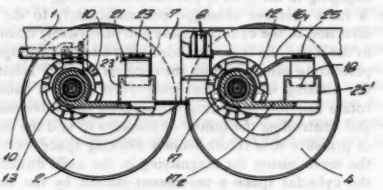
1. A snowmobile comprising a chassis, a drive sprocket mounted on said chassis, a track suspension assembly, a track trained around said sprocket and said track suspension assembly, rear arm means for floatably connecting said chassis to said track suspension assembly, a forward link having a lower end and having an upper end pivotally connected to said chassis about an axis fixed with respect to said chassis, a plurality of vertically spaced mounting means on said track suspension assembly, and means selectively pivotally connecting said lower end of said link to one of said mounting means.

3,945,452

DRIVE FOR FOUR-WHEEL DRIVEN MOTOR VEHICLES

Hermann Klaue, 24, Tour D'Ivoire, 1820 Montreaux, Switzerland

Continuation-in-part of Ser. No. 190,616, Oct. 19, 1976, abandoned. This application May 1, 1973, Ser. No. 356,208
Claims priority, application Switzerland, Sept. 16, 1971, 13538/71; Nov. 30, 1972, 17469/72
Int. Cl. B60k 17/34
U.S. Cl. 180—24.09 13 Claims



1. In a vehicle with a chassis frame, a drive unit adapted to drive four wheels, the wheels being driven by axle shafts arranged transversely relative to the vehicle longitudinal direction, characterized by the combination of:

the drive unit comprising a change speed transmission with its longitudinal direction extending lengthwise to the vehicle longitudinal direction,

the drive unit further comprising a transfer gear assembly connected to the output of said transmission and to two transfer shafts, the transfer gear assembly being arranged in the vehicle with its transfer shafts extending parallel to the vehicle longitudinal direction,

the drive unit further comprising differential gear driven by said transfer shafts and driving said axle shafts,

a housing suspended on said chassis frame, said housing commonly enclosing said change speed transmission, said transfer gear assembly, at least one of said transfer shafts and at least one of said differential gears,

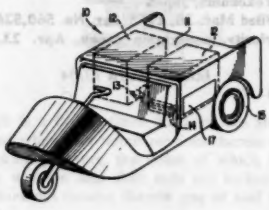
a starting device between the engine and the drive unit, the starting device comprising a brake assembly arranged outwardly of the housing and having a rotating member drivingly connected with a member of said transmission.

3,945,453

SPRING POWER CELL FOR VEHICULAR SPRING MOTOR

Jerimiah B. Black, 2065 Church Creek Drive, Charleston, S.C. 29407

Filed Oct. 23, 1974, Ser. No. 517,237
Int. Cl.² B60K 9/02
U.S. Cl. 180—54 R 11 Claims



1. A spring power cell for providing motive power to a vehicular spring motor comprising:

an elongated tubular housing having a drive end and a wind end;

a spirally-wound spring element concentrically disposed interiorly of said housing;

a journaled drive shaft axially disposed at the drive end of said housing and extending partially thereinto:

a first axial slot disposed at the inwardly extending end of said drive shaft for releasably engaging one end of said spring element;

a journaled wind shaft axially disposed at the wind end of said housing and extending partially thereinto; and

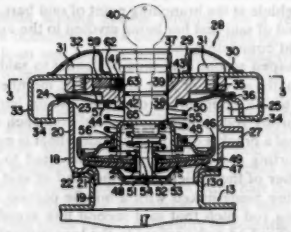
a second axial slot disposed at the inwardly extending end of said wind shaft for releasably engaging the other end of said spring element.

3,945,454

RADIATOR FOR A VEHICLE ENGINE

Isao Kinoshita, Iwata; Tosio Nagara, Toyota, and Tosiro Kaziwara, Kariya, all of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata and Nippon Denso Co., Ltd., Kariya, both of, Japan

Filed Feb. 26, 1975, Ser. No. 553,082
Claims priority, application Japan, Feb. 27, 1974, 49-23600
Int. Cl.² B60K 11/02
U.S. Cl. 180—68 R 16 Claims



1. A radiator for a vehicle engine comprising a radiator body having a mouth portion forming a cooling medium supply port, a radiator cap for closing said cooling medium supply port, said mouth portion having passage means to permit said cooling medium supply port to communicate with the open

air, valve means for normally closing said passage means, locking means for locking said radiator cap to said mouth portion and operatively associated with said valve means so as to compulsively open said valve means irrespective of the interior pressure level of said radiator, and a key for actuating said locking means.

3,945,455

STEERING LINKAGE IN WHEELED VEHICLE FOR STEERING THE VEHICLE ALONG GUIDE RAILS

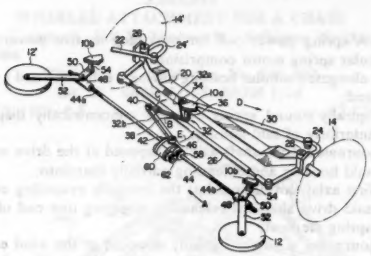
Mitsuharu Hamada, Yokohama, and Hiromichi Uchiyama, Tokyo, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Mar. 20, 1975, Ser. No. 560,526

Claims priority, application Japan, Apr. 23, 1974, 49-46160[U]

Int. Cl.² B61B *13/04*

U.S. Cl. 180—79 7 Claims



1. A steering linkage in a wheeled vehicle having at least a pair of retractable guide wheels other than ordinary road wheels for guiding the vehicle along a guideway provided with curved guide rails, the linkage comprising:

a connecting rod connected at one end thereof to a steering arm for steerable road wheels of the vehicle;

a first link member consisting of first and second bars fixed at a first angle with each other at one end of each bar, said first link member being pivoted to a structural member of the vehicle at the branching point of said bars, the extending end of said first bar being pivoted to the extending end of said connecting rod;

a bar-shaped second link member equal to said second bar in length, an end of said second link member being pivoted to the extending end of said second bar; and

a supporting rod supporting movably on each end portion thereof a bracket on which a guide wheel is mounted, said supporting rod being movably connected to a structural member of the vehicle, the other end of said second link member being linked with a middle portion of said supporting rod such that said second link member is rotatable about an axis vertical to the longitudinal axis of said supporting rod; said second link member making a second angle between said second bar when the guide wheels are positioned to roll on the guide rails, said second angle becoming zero when the guide wheels are retracted and said supporting rod is moved toward said first link member.

3,945,456

SERVO STEERING SYSTEMS FOR MOTOR VEHICLES

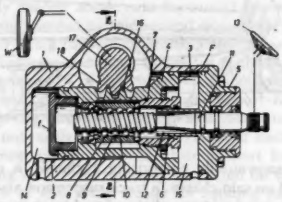
Günther Strauff, Kaarst, Germany, assignor to Langen & Co., Dusseldorf, Germany

Filed Nov. 15, 1974, Ser. No. 524,377

Claims priority, application Germany, Nov. 22, 1973, 2358184

Int. Cl.² B62D *5/08*

U.S. Cl. 180—79.2 R 14 Claims



1. In a servo steering system for motor vehicles, comprising, in combination:

a. a housing provided with a cylinder space and a groove parallel to an axial direction of the cylinder space;

b. a steering worm shaft operationally connected to a steering wheel, said shaft penetrating the housing and extending into the cylinder space of the housing;

c. a servo piston axially displacably arranged in the cylinder space for dividing the cylinder space into two separated working spaces, the servo piston being engaged by the worm shaft;

d. a lever associated with the servo piston, the lever moveable in the axial direction of the servo piston and extending radially away from the axis of the servo piston, the lever having an axial displacement which at least corresponds with the displacement of the servo piston and engaging in the groove provided in housing;

e. a valve member arranged perpendicularly to the axial direction of the cylinder space and operatively connected to the lever, the lever provided with a recess arranged for permitting minute tilting movements radially relative to the housing when the steering worm shaft is caused to rotate and for, accordingly, operating the valve member and controlling the inflow of pressure to and the outflow of pressure to a return from a working space formed by the servo piston for magnifying in the axial direction of the cylinder space a movement started by the steering worm shaft; and

f. a control piston included in the valve member provided with reaction areas placed under stress for transmitting a feeling of steering to the steering wheel and a driver of the vehicle;

the improvement wherein:

g. the servo piston is constructed as a stepped piston having a pair of operational surface of different areas, the working space associated with smaller area operational surface being connected directly to a pressure source, and the larger operational surface associated working space being connected to the pressure source or return line by means of the valve member;

h. the valve member control piston is provided with a pair of reaction areas, the effective areas of which are substantially in the same ratio as the effective areas of the working spaces of the stepped piston; and

i. said valve member control piston including at least one auxiliary piston which is displacably, spring-centered opposite said groove in the housing for operation by the

lever in relation to torque conditions applied by the steering worm shaft.

3,945,457

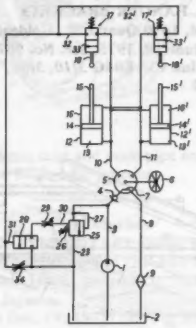
HYDRAULIC STEERING APPARATUS

Carl Ivar Olsen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Division of Ser. No. 416,179, Nov. 15, 1973. This application Jan. 13, 1975, Ser. No. 540,552

Int. Cl.² B62D 5/06

U.S. Cl. 180—79.2 R 2 Claims



1. Hydraulic steering apparatus comprising a sump, two motors for controlling parts to be steered, said motors including movable motor elements, a steering wheel operated control device having supply and exhaust openings and selectively reversible control ports with each of said control ports alternating as a supply and exhaust port, said control ports each being oppositely connected to one side of one of said motors and to the other side of the other of said motors, a continuously operable pump between said sump and said control device supply opening, a pair of control conduits connected to said control ports and meeting at a junction, a pair of stroke limiting control valves in said control conduits actuatable alternately to open positions by said movable motor elements, and an exhaust conduit from said junction to said sump, a short circuiting path shunting said pump, a pressure operated switching valve in said short circuiting path, a pressure operated pilot valve for controlling said switching valve, a spur connection between said pilot valve and said exhaust conduit, and throttle means in said exhaust conduit downstream from said spur connection to create a pressure at said spur connection to cause concomitant opening of said pilot valve and said switching valve.

3,945,458

INTERLOCKING DEVICE FOR MANUAL CHANGE SPEED GEAR

Kunihiko Suzuki, Yokohama, and Katsuyasu Kurisu, Kawasaki, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Oct. 4, 1974, Ser. No. 512,229

Claims priority, application Japan, Nov. 5, 1973, 48-127133

Int. Cl.² B60K 28/00

U.S. Cl. 180—82 C 8 Claims

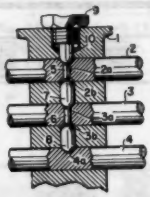
1. An interlocking device for a manual change speed gear of a motor vehicle, comprising:

a plurality of spaced apart parallel shift rods for changing gears;

interlocking plungers between adjacent said shift rods;

separating pieces positioned between adjacent said interlocking plungers in axial alignment therewith, said separating pieces being contained in transverse bores of respective shift rods; and

an actuator causing said interlocking plungers to normally lock said shift rods, including a rod shaped member which is arranged adjacent one of said interlocking plungers in parallel with said shift rods and formed with a notch at a portion of an outer peripheral surface thereof, said rod shaped member having two relative positions thereof one



of which is a first position wherein said shift rods are unlocked when said notch receives therein one of said interlocking plungers, the other of which is a second position wherein said shift rods are locked when said notch does not receive therein one of said interlocking plungers.

3,945,459

COLLISION SENSING SYSTEM FOR VEHICLES

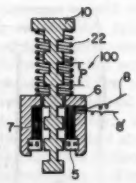
Kazuo Oishi, Oobu; Takashi Yamada, Anjo, and Takeshi Matsui, Kariya, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed July 23, 1973, Ser. No. 381,386

Claims priority, application Japan, July 26, 1972, 47-75402; Feb. 12, 1973, 48-19027[U]; Feb. 20, 1973, 48-22633[U]; Mar. 31, 1973, 48-39472[U]

Int. Cl.² B60R 21/02

U.S. Cl. 180—91 5 Claims



1. A collision sensing system mounted on a vehicle for detecting the occurrence of a collision comprising:

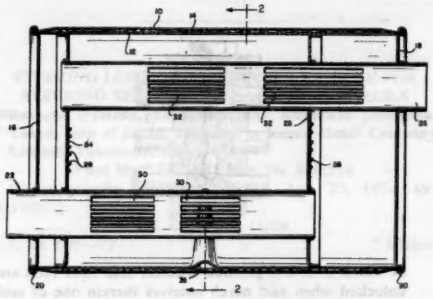
a coil, at least one magnet mounted on a magnetic stator means together with said coil, and a shaft movable through said coil in response to a collision, at least one of said shaft and said stator being fixedly secured to said vehicle wherein said shaft moves with respect to said stator when said vehicle accelerates, said shaft being made of magnetic material and having means for changing the flux linking said coil when said shaft moves with respect to wherein the movement of said shaft with respect to said stator causes a plurality of potential changes across said coil during a time interval between the beginning and the end of the acceleration of the vehicle, wherein when the rate of said potential changes exceeds a predetermined value of collision is detected, said plurality of potential changes inhibiting a spurious potential from causing an indication of a collision.

3,945,460

MUFFLER WITH RUPTURE CONTROL MEANS

Robert H. McMillan, Columbus, Ind., assignor to Arvin Industries, Inc., Columbus, Ind.

Filed Sept. 3, 1974, Ser. No. 502,447
Int. Cl.² F01N 7/18
U.S. Cl. 181—61 2 Claims



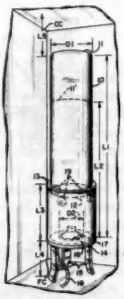
1. A muffler, comprising a shell assembly having inner and outer sheet-metal shells disposed in coaxial alignment, an asbestos wrap interposed between said shells, a pair of end caps connected to the ends of said shells for closing the ends thereof, inlet and outlet conduits mounted in at least one of said end caps, sound attenuating means mounted in said shell, and a groove formed in said inner shell intermediate its length and extending partially therearound, said groove being separate from said sound attenuating means and forming a weakened section in said shell.

3,945,461

SOUND SPEAKER SYSTEM

Ralph J. Robinson, 121 W. McFarlane Drive, Ventura, Calif. 93001

Filed Oct. 16, 1974, Ser. No. 515,080
Int. Cl.² H05K 5/00
U.S. Cl. 181—153 3 Claims



1. A sound speaker system including:

a. A first elongated vertical cylinder having upper and lower open ends, a given inside diameter and a given length, said length constituting an integral multiple greater than 2 of said given inside diameter;

b. a secondary cylinder of length at least equal to said given inside diameter of said first elongated cylinder, said secondary cylinder telescopically receiving the lower open end of said first elongated cylinder;

c. stop means for supporting said first elongated cylinder in a given telescoped position in said secondary cylinder;

d. a loudspeaker having a nominal given diameter equal to ½ said inside diameter of said first elongated cylinder disposed in the lower end of said secondary cylinder so that the overall length of the elongated and secondary cylinders can be adjusted to equal at least one integral multiple greater than the integral multiple of said inside diameter defining the length of said first elongated cylinder only; and

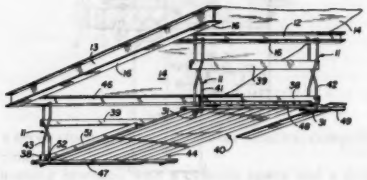
e. a base stand supporting said loudspeaker and lower open end of said secondary cylinder a given distance above the floor so that sound can freely pass from both the upper and lower open ends of the telescoped cylinders.

3,945,462

HANGER BRACKETS

James D. Griswold, 1490 Quartz St., Golden, Colo. 80401

Filed June 18, 1975, Ser. No. 587,934
Int. Cl.² E04G 3/10, 5/06
U.S. Cl. 182—150 9 Claims



1. Hanger brackets for the suspension of platform elements from the overhead supports of a building comprising paired components of similar construction wherein each component is inclusive of a gripping end for upward disposition to engage the building support and elongated force transmitting legs disposed angularly away from said gripping ends to depend downwardly therefrom, with each of said legs providing a plurality of longitudinally spaced apart pivot openings disposed centrally of the length thereof and with each of said legs further providing a plurality of adjustment holes disposed in longitudinally spaced positions at the second and lower ends thereof, and a pivot pin for selective disposition through separate openings in each of said leg pairs whereby the legs are joined together in scissors arrangement with the gripping ends of each leg being disposed inwardly for movement toward mutual contact, a spreader bar for extension between the otherwise free lower ends of said legs, and fasteners for selectively joining said spreader bar and the lower leg ends together when the gripping ends of said brackets are engaged to a building support.

3,945,463

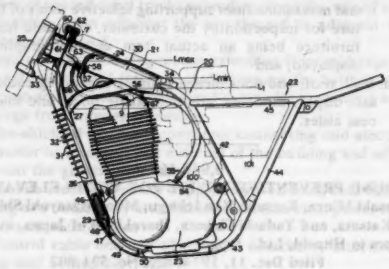
LUBRICATION SYSTEM FOR MOTORCYCLES

Ryozo Okano, Iwata, and Nobuyoshi Tominaga, Hamamatsu, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Shizuoka, Japan

Filed July 25, 1975, Ser. No. 598,757
Claims priority, application Japan, July 27, 1974, 49-86425; July 31, 1974, 49-87639; Aug. 1, 1974, 49-88490
Int. Cl.² F16N 7/14
U.S. Cl. 184—6.13 13 Claims

1. A lubrication system for motorcycles provided with a lubrication oil tank defined by the internal spaces of the main pipe, down tube and tension pipe constituting the forward half section of a frame unit so as to lubricate the driven parts in an engine housing, wherein the down tube communicates at the upper end with the forward end portion of the main pipe and is provided at the lower end with a lubrication oil supply tube for conducting lubrication oil into the engine housing; and the

tension pipe extends obliquely downward to the forward side, and is connected at the upper end to the main pipe behind the



junction of the down tube and main pipe and at the lower end to the down tube below said junction.

3,945,464

OIL-INJECTION-TYPE ROTARY COMPRESSOR HAVING A CENTRIFUGAL WATER SEPARATOR

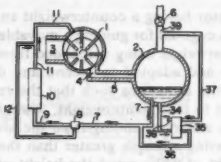
Goro Sato, Atami, Japan, assignor to Hokuetsu Kogyo Co. Ltd., Niigata, Japan

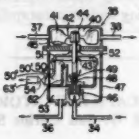
Filed Dec. 19, 1973, Ser. No. 425,994

Claims priority, application Japan, Jan. 13, 1973, 48-6305; Apr. 18, 1973, 48-43111

Int. Cl.² B04B *11/00*

U.S. Cl. 184—6.16 4 Claims





1. In combination, an oil injection type rotary compressor having a centrifugal water separator disposed in the cooling and lubricating system thereof, said compressor having a discharge port from which gas is discharged under pressure, and which is in communication with said water separator through a pressure vessel and oil separator, said centrifugal water separator having a rotary unit, means, having inlet and outlet sides, driving said rotary unit to separate water particles, contained in the oil, from the oil, other means maintaining a fluid pressure at said inlet side corresponding to the pressure of the gas discharged from said compressor, further means maintaining a fluid pressure at said outlet side which is lower than that at said inlet side, wherein said other means includes conduit means disposed between said pressure vessel and oil separator and said inlet side of said means, said conduit means providing a flow path for the oil, and water container therein, and received from said pressure vessel and oil separator, and wherein said further means includes a pump means disposed between said outlet side of said means and said pressure vessel and oil separator, where by the pressure differential across said means causes said rotary unit to be revolved and thereby discharge the water particles from said separator.

3,945,465

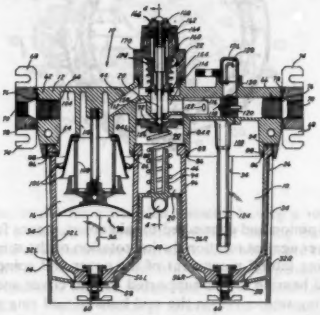
MULTI-FUNCTION AIR TREATMENT UNIT

John Vander Horst, Lakewood, and Myron Dunn, Littleton, both of Colo., assignors to Wilkerson Corporation, Englewood, Colo.

Continuation of Ser. No. 350,967, April 13, 1973, abandoned. This application Nov. 7, 1974, Ser. No. 521,575

Int. Cl.² F01M *1/00*

U.S. Cl. 184—6.24 23 Claims



1. A multiple-function unit for treating air comprising a body having an air passage therethrough with an inlet at one end and an outlet at the other and defining a manifold; first air-treatment means connected into said manifold air passage adjacent the inlet thereof and being operative to intercept the airstream in the manifold air passage and to modify said airstream before returning said stream thus modified to said manifold air passage; second air-treatment means connected into said manifold air passage adjacent the outlet thereof and being operative to intercept the airstream issuing from said first air treatment means and to further modify said airstream before returning said airstream to said manifold air passage outlet; a bowl-carrying subassembly symmetrical about its transverse centerline and detachably connected to said manifold in cooperation therewith to define separate, but identical chambers housing elements of said first and second airtreatment means; a bowl forming each of said chambers attached to said bowl-carrying subassembly; and symmetrically-arranged mating elements symmetrical about their transverse centerlines carried by the opposed surfaces of said manifold and said bowl-carrying subassembly and cooperating with one another in assembled relation whereby said manifold and said bowlcarrying subassembly can be reversed end-for-end relative to each other.

3,945,466

LUBRICATING DEVICE FOR ROLL SPINDLES

Bernhard Zodrow, Leichlingen; Milan Kovacev; Wolf Dietrich Stengritt, both of Dusseldorf, and Rudolf Hepp, Berlin, all of Germany, assignors to G. Schwartz & Co., Dusseldorf, Germany

Filed Aug. 26, 1974, Ser. No. 500,338

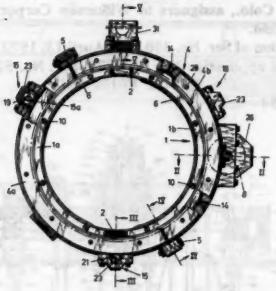
Claims priority, application Germany, Aug. 24, 1973, 2342733

Int. Cl.² F01M *1/06*

U.S. Cl. 184—7 A 16 Claims

1. A lubricating device, especially for roll spindles, comprising; a radially split gear ring adapted for mounting on a roll spindle for rotation therewith and having axial hub portions, a pinion meshing with said gear ring and forming a pump therewith, lubricant passages communicating with at least some of the tooth spaces of the gear ring and leading axially

through at least one of said hub portions, a radially split cover which is "U" shaped in cross section fitted about said gear ring and sealingly engaged said hub portions, said cover having an opening for accommodating said pinion, housing means enclosing said pinion and connected to said cover, means enclos-



ing said pinion and connected to said cover, means for holding said cover against rotation during rotation of the spindle while permitting lateral movement of the cover and spindle in unison, and bearing means supported by said cover and rollingly supporting said cover on the said hubs of said ring gear while holding the cover against lateral movement on the spindle.

3,945,467

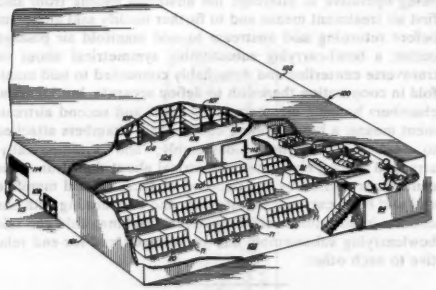
RETAIL FURNITURE DISPLAY AND SALES FACILITY

Ralph Levitz, Miami, Fla., assignor to Levitz Furniture Corporation, Miami, Fla.

Division of Ser. No. 357,951, May 7, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,904

Int. Cl.² E04H *3/04*

U.S. Cl. 186—1 R **2 Claims**



1. A retail sales facility for displaying numerous room settings of household furnishings including furniture, accessories, decorator items, selective floor covering, walls and background items for consideration by the customer in a reduced space compared to that required for actual physical display, said facility comprising:

a. a plurality of display modules having access aisles therebetween and including

i. an upright supporting structure;

ii. a photograph carried by said supporting structure of said room setting, having said household furnishings arranged therein;

iii. means for illuminating said photograph;

iv. a tactile display, located adjacent said photograph, having fragmentary, physical samples corresponding to the actual materials of construction of the furnishings shown in the photograph; and

b. a mezzanine floor supported above said display modules and access aisles;

c. passage means communicating between said access aisles and said mezzanine floor

i. said mezzanine floor supporting selective items of furniture for inspection by the customer, each said item of furniture being an actual item as photographically displayed; and

d. wall, roof, and door means defining a building enclosing said display modules, said mezzanine floor, and said access aisles.

3,945,468

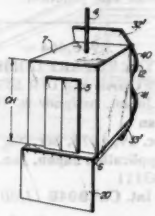
SOUND PREVENTIVE DEVICE FOR USE IN ELEVATOR

Masaki Miura, Katsuta; Ken Ichiryu, Mito; Masayuki Shigeta, Katsuta, and Tadashi Shibata, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 11, 1974, Ser. No. 531,802

Int. Cl.² B66B *11/02*

U.S. Cl. 187—1 R **5 Claims**



1. In an elevator having a counterweight and a cage with a rear plate and a cage sill for guiding a movable cage door, the cage and counterweight being suspended from opposite ends of a main rope and adapted to ascend and descend at high speeds in opposite directions such that the rear plate passes closely adjacent to the counterweight, wherein the improvement comprises a skirt extending from the lower edge of the cage sill and having a length greater than the difference between the height of a floor and the height of the cage, said skirt having a width substantially the same as that of said cage, and guide plates extending upwardly and downwardly from the rear plate and having widths substantially the same as that of said rear plate.

3,945,469

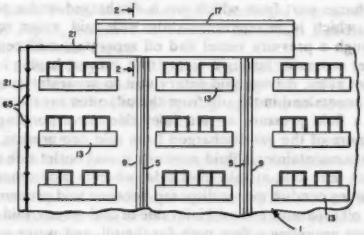
ESCAPE ELEVATOR

Roy L. Dorcich, 1888 W. San Carlos St., San Jose, Calif. 95128

Filed Jan. 4, 1974, Ser. No. 430,885

Int. Cl.² B66B *9/00*

U.S. Cl. 187—6 **9 Claims**



1. An escape and fire fighting elevator which operates externally along a side of a multi-story building, comprising:

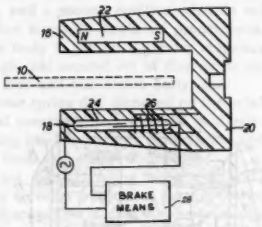
an electric motor attached atop the building;
winch means atop the building driven by said motor for winding in and out a cable;
an elevator cage attached to an end of said cable;
a pair of spaced apart tracks extending along the side of said building from adjacent the top thereof to adjacent the bottom thereof;
a pair of track following means extending from said cage to said tracks, said tracks including means for holding said cage adjacent the building and means for preventing said cage from moving sideways;
a fire-shielded electrical connector connecting said electric motor to a control box external of the building and adjacent the ground floor thereof;
a mobile electrical power supply removed from said building and detachably attachable via an electrical power line to said control box;
a control cable one end of which is detachably attachable to said control box; and
a remote controller attached to the other end of said control cable, said control cable being long enough so that an operator of said remote controller can be far enough from said building to observe the progress of a fire therein.

3,945,470

POSITIONAL CONTROL

George Eric Minns, Middlesex, England, assignor to Dewhurst & Partner Limited, Middlesex, England

Filed Mar. 11, 1974, Ser. No. 449,604
Claims priority, application United Kingdom, Mar. 16, 1973, 12881/73
Int. Cl.² B66B *1/50*
U.S. Cl. 187—29 R **12 Claims**



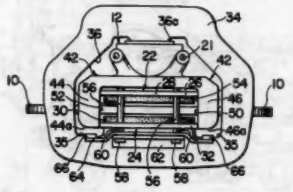
1. Control apparatus for controlling the relative motion of first and second relatively movable members, said apparatus comprising:
a. flux responsive means attached to one of said first and second members;
b. magnetic means attached to the other of said first and second members for cooperation with said flux responsive means to change the flux therethrough on relative movement of said first and second members;
c. means responsive to the rate of change of flux through said flux responsive means to provide a control signal in accordance therewith; and
d. means for reducing the relative speed of said first and second members in response to increase in said control signal, whereby to tend to maintain the rate of change of flux through said flux responsive means at a constant level.

3,945,471

DISC BRAKE PAD WEAR INDICATOR STRUCTURE

Kazuaki Shimizu, Yokosuka, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Aug. 27, 1974, Ser. No. 501,085
Claims priority, application Japan, Aug. 28, 1973, 48-100148[U]
Int. Cl.² F16D *66/02*
U.S. Cl. 188—1 A **8 Claims**



1. A disc brake for a wheeled vehicle, having a rotatable brake disc, a stationary hydraulic cylinder having inner and outer pistons slidable in opposite directions which are substantially parallel to the axis of said brake disc, said pistons defining a fluid chamber therebetween into which pressurized fluid is suppliable to initiate braking, directly and indirectly actuated friction pad assemblies positioned adjacent to the opposed faces of said brake disc, said directly actuated friction pad assembly being in abutting engagement with said inner piston and thereby forced against said brake disc when said inner piston is moved by said pressurized fluid, a yoke movable in a direction parallel to said axis of said brake disc by said outer piston to move said indirectly actuated friction pad assembly, and a torque absorbing structure integrally formed with said stationary hydraulic cylinder and having a pair of legs straddling said brake disc for guiding said directly and indirectly actuated friction pad assemblies, characterized by elastic means being mounted on said yoke and normally spaced from said torque absorbing structure, said elastic means reacting against said yoke under actuated conditions only when said indirectly actuated friction pad is worn to such an extent that said yoke travels towards the face of said brake disc in excess of a preselected distance and at least a portion of said elastic means comes into contact with said torque absorbing structure.

3,945,472

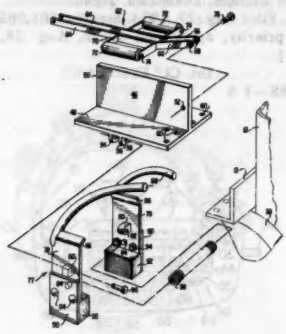
LEVER ACTUATED BRAKE ASSEMBLY

Jack Peters, 24008 Bessemer St., Woodland Hills, Calif. 91364, and DeLoris Joan Barrett, 6206 Satsuma Ave., Hollywood, Calif. 91606

Filed July 8, 1974, Ser. No. 486,704
Int. Cl.² F16D *55/228*
U.S. Cl. 188—72.7 **9 Claims**

1. A brake apparatus comprising:
a first lever;
first pivot means for said first lever;
at least one brake lever;
second pivot means for said at least one brake lever;
at least one brake shoe supported by said at least one brake lever; and
means responsive to the pivoting of said first lever about said first pivot means as the brake is applied for applying a force from a first point which moves along the length of said first lever in a direction to increase the mechanical advantage of said first lever, to a second point which moves along the length of said at least one brake lever to concurrently increase the mechanical advantage of said at least one brake lever whereby pivoting of said first

lever to apply braking force provides a continuous change in the effective length of both said levers and a continuous increase in the mechanical advantage of both said first lever and said at least one brake lever.



3,945,473

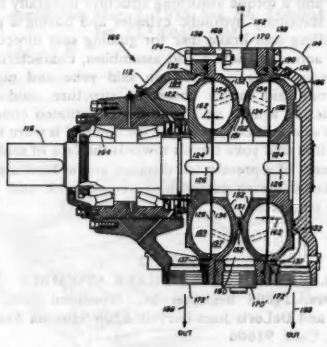
INDIVIDUALIZED STATOR AND ROTOR FOR HYDROMATIC BRAKES

George A. Prather, and Steve A. Braschler, both of Coffeyville, Kans., assignors to Parmac, Inc., Coffeyville, Kans.

Continuation-in-part of Ser. No. 277,669, Aug. 3, 1972, Pat. No. 3,860,097. This application May 28, 1974, Ser. No. 474,045

Int. Cl.[2] F16D 57/04

U.S. Cl. 188—296 1 Claim



1. A hydromatic brake system, including:

housing means having a separate first end wall, intermediate cylindrical spacer, and separate second end wall;

shaft means rotatably supported in said housing means;

first and second rotor-stator sets comprising:

individual first and second brake rotors means each identically constructed and having a single annular liquid space with a plurality of webs defining a plurality of pockets, said webs leading in the direction of rotation, each having an outer peripheral surface,

individual first and second brake stator means each identically constructed and having a single annular liquid space substantially identical to that of said annular space of said rotors with a plurality of webs defining a plurality of pockets, said webs leading in a direction opposite to the direction of rotation of said rotor, a conduit passing through each of said webs in said stator to provide communication from a back surface thereof to each of said pockets, each stator having an outwardly extending circular seal lip means on said back surface, an outwardly extending circumferential planar flange, and an inner peripheral rim axially extending, on the side of said liquid space, from the outer rim of said stator;

said first stator assembled such that its said flange is sealable retained between said first end wall and said spacer with its liquid space facing said first end wall;

said second stator assembly such that its said flange is sealably retained between said spacer and said second end wall with its liquid space facing said second end wall, said planar circular seal lip means of said first and second stator means in contact back to back and sealed by said planar circular sealing means, the back surfaces of said first and second stator means and said spacer defining an annular inlet space;

said first and second rotor means spacably attached to said shaft with the respective pockets facing their respective stator pockets, the back surface of said first rotor means and said first end wall defining a first annular outlet space, the back surface of said second rotor means and said second end wall defining a second annular outlet space, said outer peripheral surfaces of each said rotor positioned opposite said inner peripheral rim of each respective stator with a selected small radial clearance therebetween to maintain a substantially fixed liquid back pressure in said pockets; and

means to supply a continuous flow of hydraulic liquid to said annular inlet space, and means to remove said liquid from said annular outlet spaces.

3,945,474

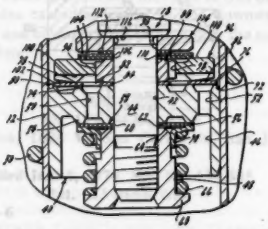
SHOCK ABSORBER

Dale A. Palmer, Monroe, Mich., assignor to Monroe Auto Equipment Company, Monroe, Mich.

Filed Jan. 20, 1975, Ser. No. 542,617

Int. Cl.[2] F16F 9/348

U.S. Cl. 188—322 4 Claims



1. A shock absorber piston construction comprising,

a piston body having means thereon connected to one end of an associated piston rod,

said piston body being formed with first and second sets of axially extending, circumferentially spaced flow ports,

said sets of flow ports being concentrically oriented, with said first set being spaced radially inwardly from said second set,

a first annular axially extending valve seat on one end of said body adjacent said first set of flow ports,

a first valve member engageable with said first valve seat to block fluid flow through said first set of flow ports,

second and third annular axially extending valve seats on the opposite end of said piston body and located radially inwardly and outwardly from said second set of flow ports,

a second valve member in the form of a flat annular valve disc extending radially of said body directly adjacent said second and third valve seats and engageable therewith to block fluid flow through said second set of flow ports,

said second valve member having a first fluid flow passage formed therein communicating with said first set of flow ports,

an annular compression plate disposed on the axially opposite side of said valve disc from said piston body, the side of said compression plate confronting said valve disc having a plurality of circumferentially spaced, radially extending recesses formed therein providing a second flow passage that is serially communicable with said first flow passage,

said side of said compression plate being tapered radially outwardly and axially away from said valve disc, whereby to permit the outer peripheral portion of said valve disc to flex away from one of said second and third valve seats and thereby allow said first magnitude of fluid flow through said second set of flow ports,

said plate having a central annular opening through which said one end of said piston rod extends,

a valve guide member located coaxially of said piston body and at least partially within said annular opening of said compression plate,

said guide member having a non-circular outer peripheral edge which defines with the inner periphery of said annular opening a plurality of circumferentially spaced guide points for guiding said compression plate for axial movement relative to said piston body between a first position maintaining said valve disc adjacent and engaged with said second and third valve seats but permitting said first magnitude of fluid flow through said second set of flow ports, and a second position wherein said second valve member is axially displaced predeterminately from said piston body to permit a greater magnitude of fluid flow through said second set of flow ports and between said valve disc and said piston body, and

at least one spring disc disposed on the axially opposite side of said compression plate from said valve disc yieldably resisting axial movement of said plate and said valve disc away from said piston body,

said spring disc extending radially of said piston rod and having an outer peripheral portion thereof bearing upon the adjacent side of said compression plate and an inner peripheral portion clampingly engaged with the adjacent side of said guide member.

3,945,475

PRESSURIZED DIFFERENTIAL VALVE

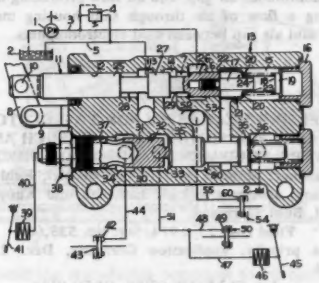
Ramkishan Khatti, Racine, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 23, 1974, Ser. No. 536,033

Int. Cl.² F16H *1/44*; B60K *29/02*

U.S. Cl. 192—4 A **10 Claims**

1. A hydraulic valve means for controlling a differential clutch comprising a control valve including a valve element adapted for selectively connecting and disconnecting a source of pressurized fluid to a differential clutch, means defining a sump chamber in said hydraulic valve means adapted for connection to sump, means defining a control chamber in said control valve, a spring means in said control chamber normally biasing said valve element for interruption of communication between said source of pressurized fluid and said differential clutch, a relay valve including a valve member for selectively providing communication and interrupting of communication between said source of pressurized fluid and said control chamber, resilient means normally biasing said valve member of said relay valve to a position providing communication between said source of pressurized fluid and said control chamber, means defining a hydraulic actuator defining an actuating chamber in said relay valve adapted for connection to a hydraulic brake system, said hydraulic actuating chamber receiving pressurized fluid to interrupt communication between said source of pressurized fluid and said control chamber against the force of said resilient means when said hydraulic brakes are actuated, said resilient means biasing said valve member of said relay valve for providing communication between said source of pressurized fluid and said control chamber for pressure biasing said control valve element to provide communication between the said source of pressurized fluid and said differential clutch when said brakes are released.



3,945,476

MOTOR CONSTRUCTION

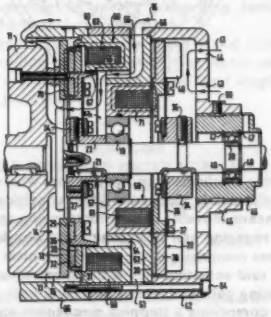
Wilhelmus Maria de Jong, Amsterdam, Netherlands, assignor to Quick-Rotan Becker & Notz KG, Darmstadt, Germany

Filed Apr. 25, 1974, Ser. No. 464,111

Claims priority, application Switzerland, Apr. 30, 1973, 6183/73

Int. Cl.² B60K *41/24*; F16D *13/22*, *13/60*

U.S. Cl. 192—12 D **24 Claims**



1. In a motor, a combination comprising housing means; a stator mounted in said housing means, a rotor rotatable with reference to said stator, and a rotor shaft rotatable with said rotor; a flywheel mounted on and rotatable with said rotor shaft; an output shaft separate from said rotor shaft; a stationary braking member mounted in said housing means and surrounding said output shaft with clearance; a coupling plate mounted on said output shaft axially adjacent said flywheel; a braking plate mounted on said output shaft axially spaced from said coupling plate and axially adjacent said stationary

braking member; a first electromagnet associated with said coupling plate and energizable for effecting frictional enagement thereof with said flywheel so as to be entrained by the latter; a second electromagnet associated with said braking plate and energizable for effecting frictional engagement with said stationary braking member so as to be braked by the same, said electromagnets being located in the space between said coupling plate and said braking plate and being axially and radially spaced from each other to define with one another a continuous air gap; and air flow producing means for producing a flow of air through said housing means and through said air gap between said electromagnets.

3,945,477

REVERSING MECHANISM FOR TWO CLUTCHES, ESPECIALLY FOR MOTOR VEHICLES SUCH AS PRIME MOVERS, EQUIPMENT CARRIERS OR THE LIKE

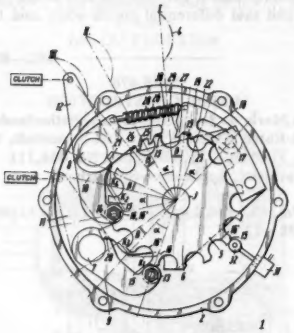
Paul Maucher, Sasbach, and Oswald Dubiel, Buhl, both of Germany, assignors to LuK Lamellen und Kupplungsbau GmbH, Buhl, Germany

Filed Dec. 23, 1974, Ser. No. 535,689

Claims priority, application Germany, Dec. 22, 1973, 2364348

Int. Cl.² F16D 67/00; G05G 9/02

U.S. Cl. 192—51 **38 Claims**



1. Reversing mechanism for two clutches wherein one of the clutches is alternately blocked in lifted condition, comprising actuating means movable over a disengaging travel path for selectively engaging and disengaging the non-blocked other clutch; means comprising a stepping mechanism and a reversing device, said actuating means being movable beyond said given actuating path and over a reversing path for actuating said means comprising a stepping mechanism and a reversing device, and a lifting device connected to said actuating means and actuable thereby for effecting engagement and disengagement of the non-blocked clutch over said disengaging travel path (I–II), and at least substantially over said reversing path (II–III) and in a force transmission path between said actuating means and disengagement members of the clutches, said lifting device being effective so that at least over partial ranges of said reversing path (II–III) a change in at least one of the path direction and the force transmission occurs, said lifting device moreover holding both clutches in lifted condition over said reversing path (II–III).

3,945,478

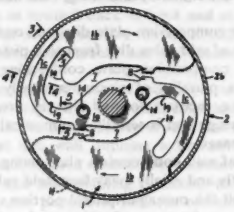
CENTRIFUGAL CLUTCH WITH ONE PIECE ROTOR

Rudolph Kellerman, Byram, Conn., and James L. Fischer, Bronxville, N.Y., assignors to Textron Inc., Providence, R.I.

Continuation-in-part of Ser. No. 462,179, April 18, 1974, abandoned. This application Apr. 18, 1975, Ser. No. 569,451

Int. Cl.² F16D 43/18, 13/18

U.S. Cl. 192—105 CD **11 Claims**



1. A centrifugal clutch comprising a clutch drum rotatable about an axis and having an inner surface of selected radius and a one piece rotor of resilient material having:

a. a hub central portion rotatable about an axis concentric with the axis of said drum

b. means for rotationally driving said hub portion

c. two like weight portions on diametrically opposite sides of said hub portion and

d. two like curved spring portions connecting diametrically opposite parts of said hub portion respectively with said weight portions

e. the dimension of said hub portion measured between points of junction with said spring portions being of the order of 50 to 60 percent the diameter of said drum

f. said weight portions having radially outer surfaces engageable with said inner surface of the drum and of a radius equal to the radius of the inner surface of the drum, said outer surfaces being disengaged from the inner surface of the drum and being eccentric of the axis of said drum when the rotor is in relaxed condition and so positioned that upon deflection into contact with said drum at a predetermined rotational speed said outer surfaces are concentric with said drum

g. the ratio of the length of each of said spring portions measured along its radially inner side to the radius of the rotor being of the order of 0.8 to 1.0

h. said spring portions having first portions extending approximately radially from said hub portion, second portions extending circumferentially rearwardly from said weight portions, said second portions being approximately concentric with the drum axis and spaced radially inward from the inner surface of the drum, and smoothly curved third portions connecting said first and second portions

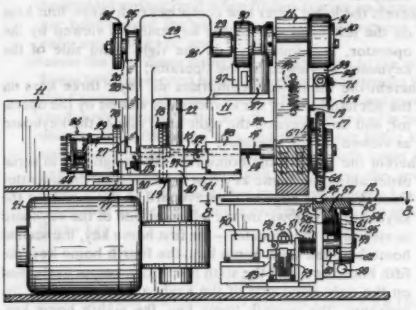
i. the transverse width of said spring portions in the plane of rotation of the rotor being of such value at continuously successive points along the lengths of said spring portions as to provide substantially equal fiber stress in the radially innermost surfaces of said spring portions throughout substantially their entire lengths when said spring portions flex under the action of centrifugal force on said weight portions to bring them into engagement with the inner surface of the drum and are subjected to driving force transmitted through said spring portions from said hub to said weight portions and thence to the drums, said fiber stress being lower than the fatigue stress and endurance level of the material of the spring portions.

3,945,479

ELECTRIC NAMEPLATE MARKER

Ralph T. Wuetig, Dolton, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed July 12, 1974, Ser. No. 488,026
Int. Cl.² B41J 1/22
U.S. Cl. 197—6.5 7 Claims



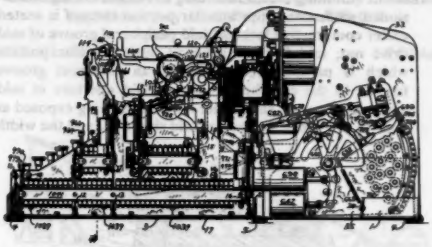
1. In an electrically actuated nameplate marker having a frame, a marking ram means slidably mounted in said frame for substantially vertical travel, indexing shaft means comprising a rigid shaft portion journaled in said frame and a flexible shaft portion connected at one end to said rigid shaft portion and journaled in said marking ram means, a rotary marking dial fixedly mounted on the distal end of said flexible shaft portion, ratchet gear means fixedly mounted on said rigid shaft portion, rotary switch means mounted on the distal end of said rigid shaft portion, detent means mounted on said frame for engagement with said ratchet gear means, solenoid means linked to said detent means for shifting said detent means in engagement with said ratchet gear means and operably connected to said rotary switch means for energization by said switch means, keyboard means operably connected to said rotary switch means for actuating said switch means, table means for supporting a workpiece to be marked below said marking ram means, and electric motor means driving said marking ram means and said indexing shaft means, an improved marking dial indexing assembly which comprises: a pair of substantially parallel rows of equally spaced gear teeth on said ratchet gear means disposed so that one row of gear teeth is out of phase relative to the other row of gear teeth by about one-half the distance between consecutive gear teeth in each row, a single detent plate means situated substantially normal to the plane of rotation of said rows of gear teeth for selective engagement with a gear tooth in one of said rows and provided with a marginal notch receiving both of said rows, and a pair of opposed solenoid means individually linked to said detent plate means for shifting said detent plate into sliding engagement with a gear tooth of one of said parallel rows in response to a signal from said rotary switch means, said gear teeth having a tooth form providing substantially line contact with said single detent plate means when said detent plate is shifted into engagement with said gear tooth.

3,945,480

JUSTIFYING, TEXT WRITING REPRODUCING MACHINE

William S. Gubelmann, deceased, late of Convent, N.J., by Walter S. Gubelmann, executor, Oyster Bay, N.Y., and William R. Grier, New Vernon, N.J., assignors to Realty & Industrial Corporation, Morristown, N.J.

Filed Dec. 28, 1971, Ser. No. 212,895
Int. Cl.² B41J 19/58
U.S. Cl. 197—84 A 68 Claims



1. A justifying reproducing apparatus to be operated responsive to information encoded on a coded medium, said justifying reproducing apparatus comprising a carriage and being capable of producing printed lines having words and normal word spaces between adjacent words and adjusting the normal word spaces by a justifying spacing amount formed by a quotient amount and a remainder amount wherein said quotient amount and remainder amount represent any number of units left in a fixed length justifying area ahead of a righthand margin of a line divided by the number of word spaces in that line, said justifying reproducing apparatus comprising:

reader means for sensing said information,

decoder means connected to said reader means for decoding said infc rmation and producing control signals,

printer means connected to said decoder means for printing characters according to certain of said control signals to form the words of said printed lines, and

carriage moving means connected to said decoder means for moving said carriage according to said control signals said normal word space plus an adjustable said justifying spacing amount,

said carriage moving means comprising justifier means connected to said decoder means,

said justifier means being responsive to said control signals for controlling said carriage moving means to move said carriage as much as the entire said fixed length justifying area for justifying.

3,945,481

RESILIENTLY MOUNTED DRIVE NUT AND CARRIAGE ASSEMBLY

Arthur F. Lindberg, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed May 8, 1974, Ser. No. 468,047
Int. Cl.² B41J 19/00
U.S. Cl. 197—90 15 Claims

1. A lead screw driven, resiliently mounted drive nut and carriage assembly comprising:

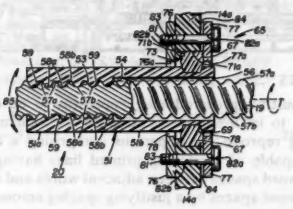
a rotatably driven lead screw;

a carriage mountable on and slidably movable along at least one guide rod positioned parallel to said lead screw, said carriage having at least one side wall with an over-sized aperture formed therein and through which said lead screw axially passes without contact;

a drive nut mountable on said driven lead screw for linear translational movement therealong, said drive nut comprising an elongated body having a first portion containing a first threaded bore extending axially a predeter-

mined distance inwardly from one end of said body; a second portion containing a second unthreaded bore extending axially inwardly from the other end of said body, said second unthreaded bore merging with said first threaded bore along an intermediate region of said body, said second unthreaded bore having a diameter larger than the diameter of said lead screw so that said body is slightly skewable relative to the axis of said lead screw; and, a peripheral groove formed near said other body end;

resilient mounting means including a resilient O-ring dimensioned so that an inner annular portion thereof is seated under compressive force in said peripheral groove of said drive nut, said O-ring havng an outer annular portion which is partially seated within an undercut groove formed in the peripheral edge of said aperture in said carriage side wall, said undercut groove being exposed at least to a first side surface of said side wall, and the width



of said O-ring being sufficient to that said O-ring protrudes outwardly a predetermined distance from at least said first side wall surface; and

first and second clamping plates, each having an over-sized central aperture through which said lead screw axially passes without contact, said clamping plates being connected and adjustably separated on opposite sides of said apertured carriage side wall so as to exert a controllable compressive biasing force against and, thereby, clamp said O-ring to said carriage side wall, with an adjustable space being established between one surface of at least one of said clamping plates and the adjacent surface of said carriage side wall as a result of the outwardly protruding portion of said resilient O-ring, the compressive force exerted on said O-ring by said clamping plates thereby determining, in part, the degree of resiliency exhibited by said O-ring in mounting said drive nut from said other body end, in a cantilevered manner, on said carrige.

3,945,482

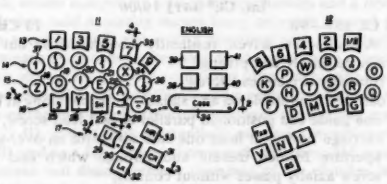
ORTHOGONAL INPUT KEYBOARDS

Harvey Einbinder, 308 W. 97 St., New York, N.Y. 10025

Filed Dec. 14, 1973, Ser. No. 424,799

Int. Cl.[2] B41J 5/10

U.S. Cl. 197—100 **13 Claims**



1. An input keyboard for the transfer of information to a machine by a human operator, comprising:

a plurality of keys arranged in transversely oriented key rows as viewed by the operator: a number key row being situated at the greatest distance from the operator; an upper letter key row being situated closer to the operator than the number key row; a home key row being situated closer to the operator than the upper letter key row; a lower letter key row being situated closer to the operator than the home key row; and a thumb key row being situated closer to the operator than the lower letter key row;

wherein the home key row comprises twelve keys: six keys on the left hand side of the keyboard as viewed by the operator, and six keys on the right hand side of the keyboard as viewed by the operator;

wherein the lower letter row comprises eight keys: four keys on the left hand side of the keyboard as viewed by the operator, and four keys on the right hand side of the keyboard as viewed by the operator;

wherein the thumb row comprises six keys: three keys on the left hand side of the keyboard as viewed by the operator, and three keys on the right hand side of the keyboard as viewed by the operator;

wherein the keys on the home row are designated in serial order along the home key row as viewed by the operator from the outer edge of the keyboard to the center of the keyboard as follows: on the left hand side of the keyboard as viewed by the operator—the first home key, the second home key, the third home key, the fourth home key, the fifth home key, and the sixth home key, respectively; and on the right hand side of the keyboard as viewed by the operator—the seventh home key, the eighth home key, the ninth home key, the tenth home key, the eleventh home key, and the twelfth home key, respectively;

wherein the keys on the lower letter key rows are designated in serial order along the lower letter key row as viewed by the operator from the outer edge of the keyboard to the center of the keyboard as follows: on the left hand side of the keyboard as viewed by the operator—the first lower letter key, the second lower letter key, the third lower letter key, and the fourth lower letter key; and on the right hand side of the keyboard as viewed by the operator—the fifth lower letter key, the sixth lower letter key, the seventh lower letter key, and the eighth lower letter key;

wherein the keys on the thumb key row are designated in serial order along the thumb row as viewed by the operator from the outer edge of the keyboard to the center of the keyboard as follows: on the left hand side of the keyboard as viewed by the operator—the first thumb key, the second thumb key, and the third thumb key; and on the right hand side of the keyboard as viewed by the operator—the fourth thumb key, the fifth thumb key, and the sixth thumb key;

wherein space and letter keys are arranged on the left hand side of the keyboard as viewed by the operator as follows: the space key, which generates the separation between words, is assigned to the second thumb key; one high frequency vowel is assigned to the second home key; a second high frequency vowel is assigned to the third home key; a third high frequency vowel is assigned to the fourth home key;

and a fourth high frequency vowel is assigned to the fifth home key; wherein each of these four high frequency vowels is a different letter;

wherein letter keys are arranged on the right hand side of the keyboard as viewed by the operator as follows: one high frequency consonant is assigned to the fifth thumb key; a second high frequency consonant is assigned to the eighth home key; a third high frequency consonant is assigned to the ninth home key; and a fourth high frequency consonant is assigned to the tenth home key; and a fifth high frequency consonant is assigned to the eleventh home key; wherein each of these five high frequency consonants is a different letter;

wherein the key tops of the second thumb key, the fifth

thumb key, the second home key, the third home key, the fourth home key, the fifth home key, the eighth home key, the ninth home key, the tenth home key, and the eleventh home key are each parallel to the base of the machine to which the keyboard is attached, so that when the machine rests on a horizontal surface, the key top of each of these keys is horizontally oriented;

wherein the stroking surface of the third thumb key, the sixth thumb key, and all eight keys on the lower letter key row are each perpendicular to the base of the machine to which the keyboard is attached, so that when the machine rests on a horizontal surface, the stroking surface of each of these keys is vertically oriented with respect to this horizontal surface, and when fingers resting on home keys are bent toward the palm, they strike continguous vertically oriented keys; and

wherein the first lower letter key is contiguous to the second home key, the second lower letter key is contiguous to the third home key, the third lower letter key is contiguous to the fourth home key, the fourth lower letter key is contiguous to the fifth home key, the fifth lower letter key is contiguous to the eighth home key, the sixth lower letter key is contiguous to the ninth home key, the seventh lower letter key is contiguous to the tenth home key, and the eighth lower letter key is continguous to the eleventh home key.

3,945,483

DEVICE FOR TREATING PRODUCTION PARTS, ESPECIALLY FOR INDUCTIVE HARDENING OF THE PARTS

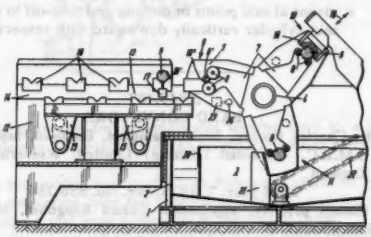
Friedhelm Reinke, Remscheid; Edgar Stengel, Wuppertal-Hahnerberg; Friedhelm Emde, Huckeswagen, and Hans Rudolf Schwarz, Remscheid-Luttringhausen, all of Germany, assignors to AEG-Elotherm, Darmstadt, Germany

Filed Sept. 18, 1974, Ser. No. 507,187

Claims priority, application Germany, Sept. 19, 1973, 2347035

Int. Cl.² B65G 47/42

U.S. Cl. 198—21 **3 Claims**



1. Apparatus for inductive hardening different types of production parts having axes of rotation comprising:

a pair of rotatable spiders having a plurality of arms for clamping therebetween production parts for indexing movement from a clamping station, through at least one treatment station to a releasing station, said arms being arranged in pairs with each pair clamping one type of part;

means for sequentially presenting workpieces to said clamping stations;

first detecting means for detecting the type of workpiece presented producing a signal indicating that type;

second detecting means for detecting the type of part the pair of arms at said clamping station clamps, and producing a signal indicating that type; and

means for causing a presented workpiece to be clamped when the signals from said first and second detecting means indicate the same type and not clamped when the signals indicate different types.

3,945,484

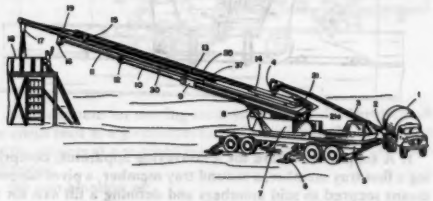
SINGLE BELT, MULTIPLE CONVEYOR SYSTEM

Robert F. Oury, Elmhurst, Ill., assignor to Rotec Industries, Elmhurst, Ill.

Continuation-in-part of Ser. No. 366,983, June 4, 1973, and a continuation-in-part of Ser. No. 329,361, Feb. 5, 1973. This application July 15, 1974, Ser. No. 488,697

Int. Cl.² B65G 15/22

U.S. Cl. 198—139 **11 Claims**



1. In a variable length conveyor apparatus for conveying concrete including at least a first and second conveyor frame, said first conveyor frame having a first forward portion and a first rear portion, said second conveyor frame having a second forward portion, a second rear portion and a longitudinal axis, said second conveyor frame being adapted to move relative to said first conveyor frame between a collapsed, retracted state and at least one extended state, the improvement comprising in combination:

a single, continuous, and substantially slack-free conveyor belt positioned on said first and second conveyor frames;

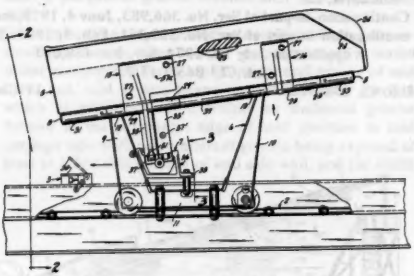
means for guiding said conveyor belt about said first and second conveyor frames, said guiding means defining a closed path wherein said conveyor belt passes forward from the first rear portion to the first forward portion, forward from said first forward portion to said second forward portion, back from said second forward portion to said second rear portion, forward from said second rear portion to said first forward portion, and back from said first forward portion to said first rear portion, said closed path having a substantially constant length in said collapsed and extended states, said conveyor belt defining a concrete-bearing portion along said second forward portion of said second conveyor frame in said extended state; and

at lease one non-binding, self-training idler assembly positioned on said second forward section, said idler assembly including a base member, means for rigidly securing said base member to said second conveyor frame substantially along said longitudinal axis, a roller assembly rotatably secured to said base member to support said concrete-bearing portion of said conveyor belt said rotatable roller assembly having a pair of rollers defining a substantially V-shaped trough and a pair of rods secured to said rotatable roller assembly substantially parallel to said pair of rollers, respectively, said rod including an upwardly turned end portion, said rods cooperatively defining means for rotating said roller assembly in response to lateral movement of said conveyor belt to align said conveyor belt with said idler assembly and second conveyor frame, said rollers and said rotating means cooperatively defining means for freely engaging and disengaging said conveyor belt and idler assembly during movement of said second conveyor frame relative to said first conveyor frame between said collapsed and extended states.

3,945,485
TRAY CONVEYING APPARATUS

Richard L. Speaker, Hartford, Wis., assignor to Speaker Motion Systems, Inc., Milwaukee, Wis.

Filed June 12, 1974, Ser. No. 478,726
Int. Cl.² B65G 17/00
U.S. Cl. 198—155 19 Claims



1. A support structure for a conveying apparatus, comprising a first tray member, a second tray member, a pivot support means secured to said members and defining a tilt axis for at least one of said tray members extended lengthwise of the tray members, means for holding the members in a transport position, each of said members including a laterally extending support surface extending outwardly and upwardly with a predetermined angular orientation with respect to said tilt axis to define a generally V-shaped load support assembly with said tray members in the transport position, and the upper and outer portion of said support surface including a stepped surface defining at least one generally vertical wall portion between vertically offset portions and extending longitudinally within the support structure.

3,945,486
CONTAINER SUPPORTING AND TRANSPORTING DEVICE

Darryl B. Cooper, Indianapolis, Ind., assignor to Glass Containers Corporation, Fullerton, Calif.

Filed Oct. 15, 1974, Ser. No. 514,392
Int. Cl.² B65G 15/00
U.S. Cl. 198—179 8 Claims

1. An apparatus for releasably suspending and transporting open-mouth rigid containers comprising:

A. overhead conveyor means having a container pick-up point and a container take-off point;

B. an assembly depending from said conveyor means, said assembly engaging a container at said pick-up point, disengaging the container at said take-off point and transporting the container along the conveyor between the pick-up and take-off points, said assembly comprising:

a. a hollow support rod having an upper end and a lower end;

b. a hollow, elongated resilient diaphragm affixed to and in open communication with the lower end of said support rod; and

c. hydraulic means cooperative with the upper end of said support rod whereby said diaphragm is deflated at said points of pick-up and take-off to permit respective insertion into and removal of said diaphragm from the container mouth and whereby said diaphragm is inflated to frictionally engage the inner surface of the container mouth during transport between said pick-up and take-off points, said hydraulic means comprising:

i. a cylinder having an upper end and a lower end;

ii. a piston disposed in said cylinder and coaxial therewith, the piston dividing the cylinder into an upper annular portion and a lower annular portion, the upper end of said support rod being affixed to and in open communication with said lower annular portion of said cylinder, said cylinder being vertically displaceable with respect to said piston;

iii. a non-compressible fluid contained in said lower annular portion of said cylinder, said hollow support rod and said resilient diaphragm;

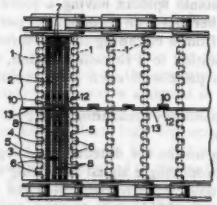
d. means for transferring a static load through said fluid whereby the diaphragm is inflated and means for relieving said static load whereby the diaphragm is deflated, said means for transferring and relieving said static load comprising a coil spring disposed in said upper annular portion of said cylinder and coaxial therewith, said spring being expanded when said cylinder is displaced vertically upward relative to the piston thereby transferring said static load, said spring being compressed when said cylinder is displaced vertically downwardly relative to the piston thereby relieving said static load; and

e. means at said points of pick-up and take-off to displace said cylinder vertically downward with respect to said piston.

3,945,487
BAND CONVEYORS

Ellis Charles Norton, Wolverhampton, England, assignor to U.M.E.C. - Boydell (Belting) Limited, Wolverhampton, England

Filed Mar. 7, 1975, Ser. No. 556,284
Claims priority, application United Kingdom, Mar. 23, 1974, 13033/74
Int. Cl.² B65G 17/06
U.S. Cl. 198—195 5 Claims



1. A conveyor band comprising spaced transverse rods and load-bearing components made of expandible plastics mate-

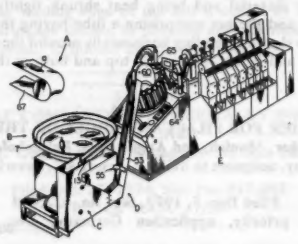
rial which extend between and are hinged to said transverse rods, wherein there is a plurality of said load-bearing components disposed end-to-end laterally of the band between each adjacent pair of said transverse rods, and adjacent ends of said plurality of load-bearing components have in respect of a first one of said ends a projection which extends away from said first end towards a second one of said ends, and in respect of said second end a flexible portion with which said projection engages and which is normally unflexed but is able to deflect inwardly away from said first end under increased pressure exerted on it by said projection, the construction and arrangement being such that when said plastics material of said load-bearing components is unexpanded and said flexible portion is unflexed said first and second adjacent ends of said load-bearing components are spaced laterally apart by said projection, and in the event of expansion of said plastics material causing lateral expansion of said load-bearing components said flexible portion is caused to be deflected inwardly by the increased resultant pressure exerted thereon by said projection, and said adjacent ends are thereby permitted to move closer together.

3,945,488

APPARATUS FOR AUTOMATIC COP FEEDING

Isamu Matsui; Shoji Sakai; Susumu Tsukada, and Susumu Kawarabayashi, all of Kyoto, Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed Aug. 7, 1972, Ser. No. 278,466
Claims priority, application Japan, Feb. 29, 1972, 47-20733; Feb. 29, 1972, 47-20736
Int. Cl.² B65G *47/24*
U.S. Cl. 198—249 **6 Claims**



1. An apparatus for automatically feeding cops to a cop supply device cooperative with an automatic winder comprising,

a cop sequencing means of a high frequency vibration type for delivering cops fed thereto at random, and for discharging said cops separately in sequential order;

a cop direction controller means (C) for receiving randomly fed cops from said cop sequencing means for controlling the head and tail direction of the cops fed from said cop sequencing means, and which commences its operation according to an electrical signal received from a winder requesting a cop to be fed thereto;

an inclined cop conveyor means (D) for receiving cops from said cop direction controller means for feeding said cops in controlled direction to a position adjacently above a cop supply device, and which commences its operation according to an electrical signal received from the winder requesting a cop to be fed thereto;

actuator means (43) for stopping said cop sequencing device, each time one cop is discharged from said cop sequencing device (B) to the cop direction controller means;

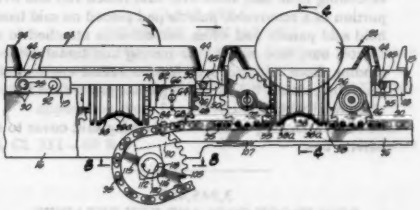
and another actuator means (55) for stopping said inclined cop conveyor means (D), each time one cop is discharged from said cop direction controller means (C).

3,945,489

ARTICLE-ORIENTING CONVEYOR

Paul F. Paddock, Riverside, and Jerry W. Cramer, Upland, both of Calif., assignors to Sunkist Growers, Inc., Sherman Oaks, Calif.

Filed Sept. 28, 1973, Ser. No. 401,886
Int. Cl.² B65G *47/24*
U.S. Cl. 198—266 **35 Claims**



1. In a system for moving successive ellipsoidal objects such as citrus fruit in a given direction of travel with the major axes of the objects at a selected orientation relative to the direction of travel,

the combination of:

a receptacle to carry an individual ellipsoidal object;

means to move the receptacle in the given direction;

a plurality of rollers on the receptacle arranged on laterally spaced parallel axes extending in the direction of receptacle movement to support the ellipsoidal object at four spaced points with said parallel axes at said selected orientation relative to the given direction of travel; and

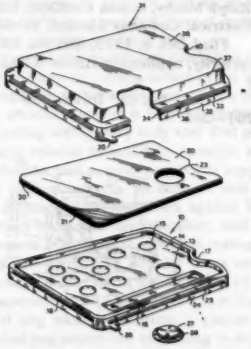
means on opposite sides of said receptacle responsive to the movement of the receptacle in the given direction to separately rotate the rollers on said respective axes to spin the ellipsoidal object to cause the major axis of the ellipsoidal object to seek said selected orientation.

3,945,490

COVERED ARTIST PALETTE APPARATUS

Vivienne J. Thompson, 2248 S. Lakeshore Drive, Clermont, Fla. 32711

Filed Oct. 31, 1974, Ser. No. 519,417
Int. Cl.² B05C *17/00*; B44D *3/04*; B65D *43/10*
U.S. Cl. 206—1.7 **6 Claims**



1. An artist palette comprising:

a palette base having a flat portion and sides and an opening therethrough for grasping said base, said base having

paint cups formed therein and a raised rim for holding a removable palette pad having a plurality of layers of sheet material, with said raised rim and said base forming a recessed area contoured to hold therein said removable palette pad;

a removable cap for covering said opening in said base when said palette is being stored;

a cover shaped to fit over said palette base, said cover having sides to fit over said base and sides and a ledge extending from said sides over said raised rim and over a portion of a removable palette pad placed on said base to hold said palette pad when said cover is attached to said palette base and said cover having additional sides extending from said ledge to form a raised cover portion whereby paint or the like on a palette pad will be held out of contact with said cover; and

removable attaching means for attaching said cover to said palette base.

3,945,491

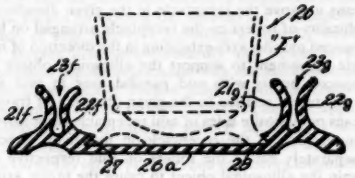
FOOLPROOF COIN AND KEY RETAINER

Ben Lindenbaum, 921 McLean Ave., Yonkers, New York, N.Y. 10704

Filed Nov. 19, 1973, Ser. No. 417,255

Int. Cl.² A45C 11/28; B65D 23/12; A45C 1/00

U.S. Cl. 206—.81 1 Claim



1. An article support comprising a strip of resilient material forming a base, a first and second pair of resilient arcuate-shaped members attached to said base and each forming a slot for receiving coins, a pair of spaced V-shaped parallel channels formed in the base and separated by a flat strip portion, each pair of arcuate-shaped members being parallel to the channels and located on the outer boundaries thereof.

3,945,492

DUAL FUNCTION ELECTRICAL SWITCH

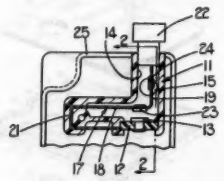
Geoffrey Ralph Mosby, Sutton Coldfield, England, assignor to Lucas Electrical Company Limited, Birmingham, England

Filed Oct. 4, 1973, Ser. No. 403,718

Claims priority, application United Kingdom, Oct. 4, 1972, 45723/72

Int. Cl.² H01H 1/26

U.S. Cl. 200—246 5 Claims



1. An electrical switch including an L-shaped flexible strip, first and second movable contacts carried by the strip, first and second fixed electrical contacts associated with the first and second movable contacts respectively, one end of one limb of the strip being fixed, and said first and second fixed electrical contacts being so positioned relative to one another that the first movable contact can be engaged with the first fixed contact by flexing said one limb of the strip along its length, the second movable contact being engageable with the second fixed contact by twisting said one limb along its length.

3,945,493

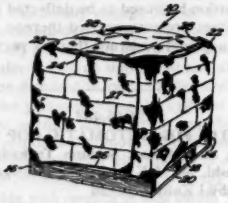
SHRINK WRAP SYSTEM FOR PRODUCTS ON PALLETS AND SLIP SHEETS

Thomas J. Cardinal, Minneapolis, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Filed Nov. 13, 1974, Ser. No. 523,608

Int. Cl.² B65D 65/00, 19/00, 53/00

U.S. Cl. 206—386 17 Claims



1. A package comprising a base composed of a pallet or slip sheet, at least one container resting upon the pallet or slip sheet, a heat shrinkable open mesh net at least partially enclosing the container, the net being formed from a heat shrinkable fiber material and being heat shrunk tightly over the container and the net comprising a tube having the shape of an endless sleeve extending horizontally around the side of the container and being open at the top and bottom thereof.

3,945,494

CARRIER FOR FILM CARTRIDGES OR THE LIKE

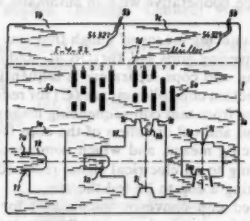
Klaus Weber, Munich, and August Hell, Deisenhofen, both of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Germany

Filed Dec. 5, 1973, Ser. No. 422,028

Claims priority, application Germany, Dec. 7, 1972, 2259934

Int. Cl.² B65D 73/00, 85/67

U.S. Cl. 206—389 18 Claims



1. A combination of a carrier and receptacles of different configurations containing photographic films, especially exposed but undeveloped photographic roll films, said carrier constituting a substantially flat panel having two surfaces at least one being provided with encoded and/or unencoded information, said panel having a plurality of openings of different configurations corresponding to said different configurations of said receptacles, and elastic detent means, at least one in each opening, a portion of either one of at least two receptacles of different configurations being received in at least one

of said openings with said portion extending into said opening engaged by the respective detent means and preventing the attachment of additional receptacles to said panel.

3,945,495

HOUSEHOLD PLASTIC FILM IN ROLL FORM AND EMBODYING A CURLED LEADING EDGE

William D. Carmody; William Robb Roy Park, both of Midland, and Gordon E. Gould, Breckenridge, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 5, 1974, Ser. No. 529,883
Int. Cl.² B65D *85/67*
U.S. Cl. 206—397 10 Claims

1. A roll of consumer type plastic wrapping film wound on a core, the film being characterized as a film having inherent residual shrinkage due to orientation imparted to the film in the longitudinal direction during the manufacture thereof, the improvement which comprises, a coating adhered to one surface of the leading edge of the roll to induce curling of said edge, to thereby promote easy identification and grasping of same to initiate the use of the roll.

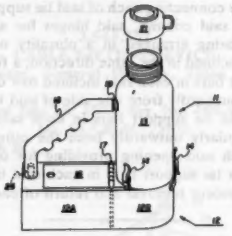
6. A roll of film contained within a dispensing carton and wherein the leading edge of the roll is curled by selectively induced shrinkage thereof to promote easy identification and grasping thereof to initiate dispensing of the roll.

3,945,496

MULTIPLE COMPARTMENT THERMALLY INSULATED CONTAINER

Camille M. Gaetano, 2720 Broadway 10, San Diego, Calif. 92101

Filed Oct. 23, 1974, Ser. No. 517,202
Int. Cl.² A45C *11/20*
U.S. Cl. 206—546 2 Claims



1. A multiple compartment thermally insulated container comprising:

a flat elongated thermally insulated container member dimensioned for carrying solid foods, said flat elongated member having a top flat surface thereon terminating in one end in a circular portion;

at least one door in said top flat surface dimensioned for receiving and dispensing solid foods;

a second thermally insulated container member dimensioned for receiving and dispensing liquid, said second thermally insulated container member being circular in cross section and conforming to the dimensions of said circular portion of said top flat elongated member and being removably coupled to a surface thereof, the said first and second members forming an L shaped assembly when coupled together; and

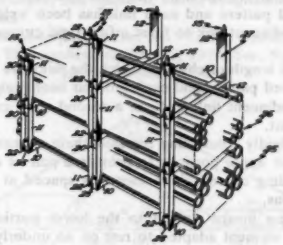
a handle member removably coupled to said second insulated container member and swively coupled to said flat elongated member.

3,945,497

STORAGE APPLIANCE

Percy Greenberg, Minneapolis, Minn., assignor to Norman Goldetsky, Minneapolis, Minn., a part interest

Continuation-in-part of Ser. No. 391,929, Aug. 27, 1973. This application Aug. 21, 1974, Ser. No. 499,305
Int. Cl.² B65D *19/38*
U.S. Cl. 211—60 R 2 Claims



1. A storage appliance which comprises:

at least first and second members formed by elongated support means having first and second spacing means extending therefrom at the ends thereof, all of said support means and spacing means having at least one flat surface with the flat surfaces of said first and second spacing means being in opposing relation to each other and generally perpendicular to the flat surface of their cooperating support means, the distal ends of said first member spacing means forming mating surfaces for said second member;

coupling means carried by each of said second member spacing means at the proximal end thereof, said coupling means having a circular aperture; and

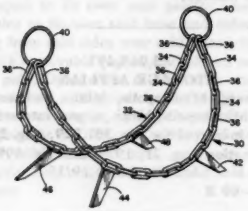
first and second peg means each being carried by a different one of said first member spacing means at the distal ends thereof for engaging said coupling means in a first mode, wherein said second member is fully supported on only one of said mating surfaces by only said first peg means and is pivotable relative to said first member, and a second mode, wherein said second member is supported on both of said mating surfaces by both of said first and second peg means and is restrained against horizontal movement relative to said first member, said first and second peg means extending beyond said mating surfaces and having a first portion of circular cross section and generally identical diameter to the diameter of said coupling means aperture and a tapered portion at its terminus with said first peg means extending a greater distance than said second peg means and remaining in engagement with its cooperating coupling means when said second member is lifted a sufficient distance from said mating surfaces to disengage said second peg means from its cooperating coupling means.

3,945,498

ARTICLE SUPPORTING DEVICE

Wesley Lampinen, Ashby, Mass. 01430

Filed Sept. 30, 1974, Ser. No. 510,555
Int. Cl.² A47F 7/00
U.S. Cl. 211—60 R 3 Claims



1. An article of manufacture comprising

a first length of chain in which the links are arranged in a curved pattern and each link has been welded to each next adjacent link to form a first rigid curved chain element,

a second length of chain in which the links are arranged in a curved pattern and each link has been welded to each next adjacent link to form a second rigid curved chain element,

means rigidly connecting the said chain elements together at their upper portions to provide a pair of downwardly extending curved chain elements spaced at their lower portions,

supporting means welded to the lower portions of each chain element adapted to rest on an underlying surface and to maintain said connected curved chain elements in a stable condition on said surface,

each of said rigid curved chain elements extending through substantially a semi-circle,

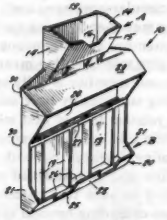
the means rigidly connecting the said chain elements together comprising a pair of rings to which said chain elements are welded.

3,945,499

STORAGE HOOK FOR RAZOR AND BLADES

De Witt M. Brownson, 10808 62nd St., Temple Terrace, Fla. 33617

Filed June 21, 1974, Ser. No. 481,808
Int. Cl.² A47G 29/08
U.S. Cl. 211—88 3 Claims



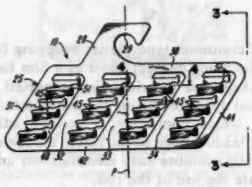
1. In a storage hook, the combination of a rear wall integral with an upper hook and a lower hook on the front side thereof, said upper hook extending outwardly and downwardly with respect to the rear wall to form a substantially triangular compartment with the apex of the triangle downward, a pair of forward extending side walls in the compartment integral at their front side edges with a front wall having a notch on the upper edge, said upper hook serving to support a safety razor with the head of the razor resting across the notch and in the triangular compartment with the razor handle hanging vertically against the front of the lower hook, said lower hook serving to support a blade cartridge, said upper and lower hooks allowing air circulation all around said razor and cartridge, said lower hook comprising a tray formed on a front side of said rear wall, said tray consisting of opposite side webs which at their forward side edges are integral with a rearwardly, downwardly inclined front wall and a plurality of ribs on a front side of said rear wall, said ribs serving to support a rear side of said cartridge when resting thereagainst, and said inclined front wall serving to support a front lower edge of said cartridge when rested at a same time thereupon.

3,945,500

NECKTIE HANGER

Alan F. Meckstroth, 2357 Shelterwood Drive, Dayton, Ohio 45409

Filed Dec. 16, 1974, Ser. No. 533,306
Int. Cl.² A47J 51/24
U.S. Cl. 211—113 5 Claims



1. An improved hanger for neckties, comprising a generally flat body of semi-rigid material, a plurality of horizontally spaced inclined support columns disposed in substantially parallel relation and defining horizontally spaced inclined openings therebetween, a set of vertically spaced tie support bars projecting cantileveredly and horizontally from each of said columns generally into the adjacent said opening, said sets of tie support bars being arranged in a plurality of substantially parallel rows inclined in the same direction, frame means integrally connecting the corresponding upper and lower portions of said support columns, a hook member projecting upwardly from said frame means and adapted to engage a clothes rod within a closet, a substantially vertical thin web hinge integrally connecting each of said tie support bars to the corresponding said column, said hinges for said sets of tie support bars being arranged in a plurality of substantially parallel rows inclined in the same direction, a first plurality of said tie support bars in each said inclined row of bars projecting angularly outwardly from one side of said body, a second plurality of said tie support bars in each said inclined row projecting angularly outwardly from the other side of said body, and each said opening providing for open space between adjacent tie support bars in each said inclined row to facilitate convenient removal and return of each necktie.

3,945,501

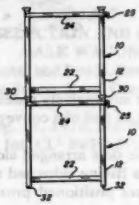
STORAGE RACK WITH INTERNESTABLE STACKING ATTACHMENTS

Richard S. Jay, Evanston, Ill., assignor to Jarke Corporation, Chicago, Ill.

Filed Apr. 14, 1975, Ser. No. 567,810
Int. Cl.² B65D 19/38
U.S. Cl. 211—177 9 Claims

1. A rigid internestable storage rack for accommodating the storage of heavy loads positioned in horizontal orientation, said rack being further adapted for transport by conventional transport vehicles such as fork lift trucks and the like, the combination comprising,

a series of four vertically and rectangularly oriented support posts,
front and rear lower brace members fixedly secured to and interconnecting opposed adjacent support posts,
a pair of opposed lower cross brace members fixedly secured to and interconnecting said front and rear lower brace members thereby to form a rigid lower assembly for said rack,
an upper rear brace member fixedly secured to and interconnecting opposed adjacent support posts,
a pair of opposed upper cross brace members fixedly secured to and interconnecting opposed and cross oriented ones of said support posts.
at least said upper rear brace member being offset and positioned externally of said corresponding opposed and cross oriented support posts,



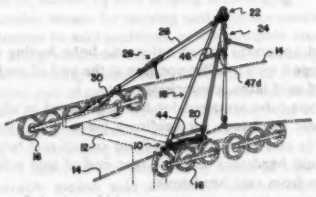
nesting means positioned on top of each of said vertical support posts,
mating nestable means for matingly nesting with said nesting means, at least one pair of said nestable means mounted on and extending downwardly from said offset and externally positioned upper rear brace member.
and stabilizing means mounted on the upper portion of said rack in opposed relation to said nestable means thereby to stabilize said rack when internested with other similar racks in a vertically offset stacking posture.
whereby the provision of at least one upper brace member having at least one pair of said nestable means mounted thereon permits said rack to be internestably stacked atop another similar rack by matingly nesting said nestable means with said nesting means such that said racks will stack in vertically offset orientation one with respect to the other.

3,945,502

CABLE LIFTING DEVICE

Robert W. Diener, General Delivery, Teton Village, Wyo. 83025

Filed July 18, 1974, Ser. No. 489,479
Int. Cl.² B66C *23/00*
U.S. Cl. 212—8 B **7 Claims**



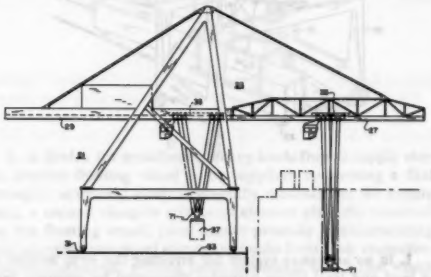
1. A portable device for lifting cable to an overhead structure comprising:
a laterally adjustable base clamping member having a means for attached and securing same to an overhead structure,
an A-frame jib pivotally mounted on said base clamping member,
hoist means for detachable connection to said cables,
means detachably connected between said overhead structure and said jib for adjusting the degree of pivot of said jib with respect to said base clamping member, and
a head assembly fixed to the upper end of said "A" frame jib, said head assembly including a stationary shaft, a rigid, unitary, bifurcated purchase element with separate loop ends, each arranged to suspend a said hoist means, and connected by a central member which is journaled for pivotal movement on said stationary shaft, a crown bow fixed at or near the ends of said stationary shaft, and a pulley rotatably mounted on said stationary shaft and straddled by said bifurcated purchase element, whereby separate hoist means may be suspended from said separate loop ends.

3,945,503

CRANE WITH A VARIABLE CENTER ROPE SUSPENSION SYSTEM

George W. Cooper, San Leandro, Calif., assignor to Fruehauf Corporation

Continuation-in-part of Ser. No. 77,584, Oct. 2, 1970, abandoned. This application Feb. 13, 1974, Ser. No. 442,092
Int. Cl.² B66C *17/06*
U.S. Cl. 212—11 **3 Claims**



1. A variable centers rope suspension system for suspending a load from an overhead traveling crane comprising,
a crane structure,
a gantry supported by said crane structure,
a pair of rails mounted on said gantry,
a pair of trolleys mounted and adapted to roll on said rails and supported by said gantry,
a frame interconnecting said trolleys and having slidable connections therewith,
means for translating said load by moving said trolleys and interconnecting frame as a unit along said gantry on said rails,
means mounted on said frame for reciprocating said trolleys with respect to said frame whereby said trolleys can be synchroneously moved on said rails with respect to the centerline of the load a selected distance toward or away from each other within the limits of the frame and whereby the reciprocation of the trolleys on the rails with respect to the frame is independent of the translational movement of the load achieved by moving the trolleys and interconnecting frame as a unit, and
a fleet through reeving system comprising,
a load engaging means having at least two sheaves mounted thereon,
at least one hoisting drum mounted on said crane structure removed from said trolleys,
at least one pair of sheaves mounted on each of said trolleys,
at least one pair of ropes reeved from said hoisting drum,
one of said pair of ropes being reeved from said hoisting drum through one of said pair of sheaves mounted on one of said trolleys, down through one of said pair of sheaves

mounted on said load engaging mean, up through the other of said pair of sheaves mounted on said trolley, and then to the outboard end of said gantry opposite said hoisting drum where it is deadended, and

the other of said pair of ropes being reeved from said hoisting drum through one of said pair of sheaves mounted on the other of said trolleys, down through the other of said pair of sheaves mounted on said load engaging means, up through the other of said pair of sheaves mounted on said other trolley, and then to the outboard end of said gantry opposite said hoisting means where it is deadended.

3,945,504

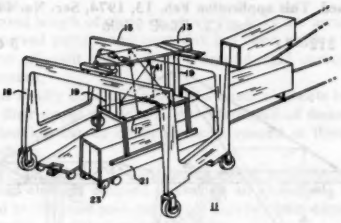
ANTI-SWAY SYSTEM FOR A SPREADER SUSPENDED FROM A CRANE

Lawrence A. Wright, Alameda, Calif., assignor to Fruehauf Corporation

Filed Mar. 11, 1974, Ser. No. 449,700

Int. Cl.² B66C 5/02

U.S. Cl. 212—14 **4 Claims**



1. In an anti-sway system for arresting the sway motion of a load and load lifting spreader suspended by separate rope hoist cables from the lifting platform of a traveling crane wherein said sway motion is arrested by means of anti-sway ropes which are freely gathered in and payed out when the load is vertically raised or lowered by said separate rope hoist cables, but which causes work to be done when the load is set into a sway motion, the improvement comprising:

a shaft rotatably secured to said lifting spreader,

rope drums mounted on said shaft having said anti-sway ropes reelable therefrom,

a clutch means engaged with each of said rope drums for rotating the shaft when the rope is unreeled from said drums and for overrunning the shaft when the rope is rewound onto said drums,

means engaged with said rope drums for rewinding slack which occurs in the anti-sway ropes due to changes in reeving geometry during the return sway motion of the suspended load, but which is not required to gather in and pay out rope when the load is vertically raised or lowered,

means engaged with said shaft for causing work to be done by said ropes when unreeled from said rope drums due to the sway of the load,

feeder reels mounted on said lifting platform with one end of said anti-sway ropes secured thereto; and

means for interconnecting said feeder reels to the vertical hoist means of said traveling crane for driving said feeder reels relative to the vertical position of said lifting spreader whereby said ropes are gathered in or payed out by said feeder reels as the lifting spreader and attached load are raised or lowered respectively, without causing substantial engagement of said rewinding and work causing means.

3,945,505

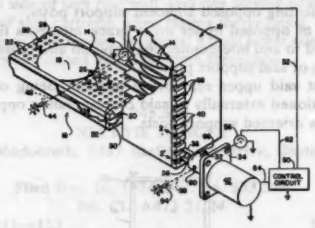
INDEXING APPARATUS

Milo W. Frisbie, and Milton R. McKinley, both of Mesa, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed July 8, 1974, Ser. No. 486,273

Int. Cl.² B65G 47/57

U.S. Cl. 214—1 BB **5 Claims**



1. An apparatus for successively indexing slots of a wafer carrier into position at an end of a conveying means, comprising:

a. a plurality of drive slots arranged along the carrier to be indexed, said slots having sides and an end,

b. a support member positioned proximate to said drive slots,

c. a rotary drive member mounted on said support member proximate to the end of the drive slots on said carrier, said rotary drive member having a plurality of pins adapted to engage the drive slots as said drive head rotates, beginning at a point proximate to the end of the drive slots, move into the slots, provide a force perpendicular to said slots against said carrier, then move back toward the point proximate to the end of the slots,

d. means responsive to motion of a wafer with respect to the wafer carrier, for initiating an index cycle, and

e. means, responsive to rotation of said drive member one indexing position, for terminating an index cycle.

3,945,506

FEED APPARATUS FOR AUTOMATIC LATHE

Philippe Scheurer, Bas-Du-Village, 2802 Develier, Bern, Switzerland

Filed Oct. 15, 1974, Ser. No. 514,785

Claims priority, application Switzerland, Oct. 16, 1973, 14638/73

Int. Cl.² B65H 5/16

U.S. Cl. 214—1.2 **11 Claims**

1. A feed apparatus for an automatic lathe having a headstock equipped with a collet opening at the end of each working cycle of said lathe, comprising:

at least one tube arranged for being disposed in alignment with said headstock for guiding a piece of bar stock engaged in said headstock, the front end of said tube being near said headstock and the rear end of said tube being remote from said headstock,

means for exerting pressure upon said bar stock for preventing it from remaining axially integral with said collet when said collet opens,

wherein said means for exerting pressure comprise: a piston engaged with clearance in said tube, said clearance forming a passage bypassing said piston,

means provided on said piston for pushing said bar stock towards said headstock responsive to a movement of said piston towards said headstock, and

a hydraulic arrangement adapted for supplying oil under pressure at said rear end of said tube and thereby urging said piston with said bar stock towards said headstock, said piston including:

an inner channel having an adjustable cross-section and being operatively parallel to said passage formed by said clearance, and

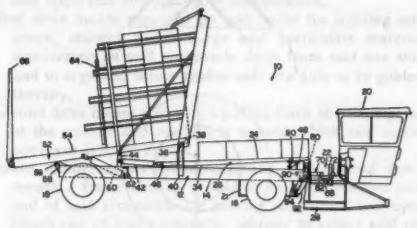
regulating means in said inner channel for adjusting said cross-section of said inner channel, wherein said oil supplied under pressure by said hydraulic arrangement passes by said piston with loss of pressure through said passage and through said inner channel in an amount determined by said regulating means.

3,945,507

TIER PATTERN SELECTION AND FORMATION FOR A BALE WAGON

James A. Olsen, Fresno, and Lee D. Butler, Kingsburg, both of Calif., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 19, 1974, Ser. No. 498,839
Int. Cl.² B65G *57/32*
U.S. Cl. 214—6 B **17 Claims**



5. In a bale wagon having means for accumulating bales and being movable between bale accumulating and non-accumulating positions and a plurality of operable means associated with said bale-accumulating means for delivering bales thereto and arranging bales into a plurality of different tier patterns, the improvement which comprises:

means associated with said bale-accumulating means for sensing bale presence at any of a predetermined number of locations;

means for selecting at which of said locations bale presence will be sensed by said sensing means; and

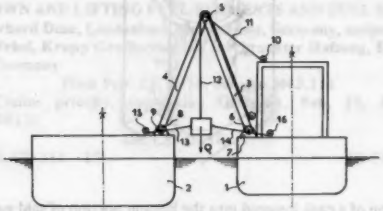
actuatable means for moving said bale-accumulating means between its said positions, said actuatable means capable of being rendered responsive to said sensing means by said selecting means such that, when at least a predetermined one of said locations has been selected for sensing bale presence and upon the presence of a bale being sensed at said location prior to completion of the delivering and arranging of bales into at least one of said plurality of different tier patterns by some of said plurality of operable means, said actuatable means responds to said sensing means to cause said bale-accumulating means to move between its said positons for facilitating further delivering and arranging of bales by said some of said plurality of operable means to complete said one of said different tier patterns.

3,945,508

DEVICES FOR TRANSFERRING HEAVY LOADS AT SEA

Jean-Paul Colin, Saint Sebastien, France, assignor to Societe Anonyme dite: Ateliers et Chantiers de Bretagne-A C B, Nantes, France

Filed Nov. 15, 1974, Ser. No. 523,962
Claims priority, application France, Aug. 6, 1974, 74.27349
Int. Cl.² B65G *67/58*
U.S. Cl. 214—13 **9 Claims**



1. A device for transferring heavy loads from a supply ship to another floating vessel to be supplied, comprising a first elongate structural element pivotally mounted on the supply ship, a second elongate structural element pivotally mounted on the floating vessel, pivot means pivotally interconnecting said elongate structural elements remote from their respective pivotal mountings, a lifting cable associated with a first winch for raising and lowering the load at the beginning and end of a transfer operation, a traction cable and a restraining cable associated with a second and third winches, respectively, and acting in opposed directions on the load during the transfer operation, whereby the cables cooperate to prevent oscillating and pendular movement of the load during the transfer operation and at the same time the resultant force exerted by the device tends to keep the supply ship at a distance from the floating vessel.

3,945,509

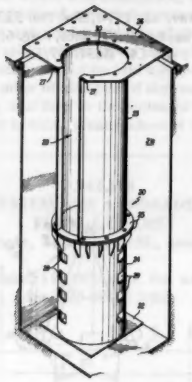
HANDLING SYSTEM FOR NUCLEAR FUEL CASKS

Sterling J. Weems, Chevy Chase, Md., assignor to MPR Associates, Inc., Washington, D.C.

Continuation-in-part of Ser. No. 224,495, Feb. 8, 1972, abandoned. This application Sept. 20, 1974, Ser. No. 507,858
Int. Cl.² B65G *1/04*; G21C *19/32*
U.S. Cl. 214—16 B **18 Claims**

8. In a system for inserting and removing a nuclear fuel cask into and out of a water filled fuel pool of a nuclear plant, a substantially vertical guide tube positioned in the pool and supported therein in fixed position, a cask, a base plate on the bottom of said cask dimensioned to approximate the transverse dimension of at least a part of the guide tube, means for lowering and raising said cask in said guide tube, whereby said base plate and guide tube coact upon accidental dropping of the cask in said tube to provide a dashpot for the descent of said cask into said pool, and said guide tube having an axial

extending channel opening in its wall in the upper portion thereof to fascilitate the introduction of fuel assemblies into

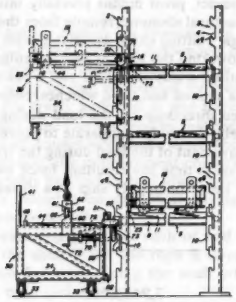


the top of a cask lowered into the bottom portion of said guide tube.

3,945,510
STORAGE EQUIPMENT

Samuel Saul, Jr., Pittsburgh, and Thomas D. Colbridge, Chalkhill, both of Pa., assignors to Rack Engineering Company, Connellsville, Pa.

Division of Ser. No. 187,608, Aug. 8, 1971, Pat. No. 3,743,115.
This application Feb. 15, 1973, Ser. No. 332,892
Int. Cl.[2] B65G *1/06*
U.S. Cl. 214—16.4 A **6 Claims**



1. For use with an adjustable pallet type storage rack having a series of equally spaced pairs of uprights each of which has two series of notches extending up the greater portion of its height and a series of spaced shelves extending between and supported by each two adjacent pairs of uprights, at least some of the shelves having spaced rails thereon extending in a front to back direction, and a dolly on at least some of said shelves with front and rear wheels guided on said rails means to releasably retain said dolly in a retracted position on said rails, the improvement comprising an outrigger adapted to be selectively raised up to and be supported on any two adjacent front uprights of the rack at the front of a selected shelf, said outrigger comprising:

a. a generally rectangular structural frame having mounting means thereon arranged for interlocking engagement with the notches in two adjacent uprights by means of which the outrigger can be hung on two adjacent front uprights at a level in front of a selected one of said shelves and remain in position thereon without other means of support,

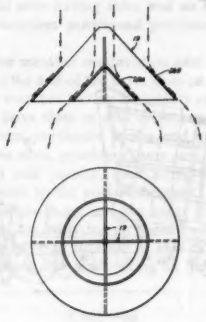
b. spaced rails on the outrigger positioned to be aligned vertically and horizontally with the rails on the selected shelf when the outrigger is so hung on two front uprights, means on said outrigger to release a dolly in a selected one of said shelves whereby a dolly may be rolled from the rails on the shelf onto the rails of the outrigger,

c. the outrigger having means thereon positioned in the path of travel of the dolly to limit the movement of the dolly on said outrigger to a position where the rear wheels of the dolly will remain on the rails on the shelf.

3,945,511
ASPHALT STORAGE SYSTEM

Ernest Delorme, P.O. Box 212 R.R. No. 3, Tillsonburg, Ontario, Canada

Filed Jan. 17, 1974, Ser. No. 434,085
Int. Cl.[2] B65G *65/32*
U.S. Cl. 214—17 C **6 Claims**



1. A silo for the storage of asphalt and like materials and subsequent discharge without substantial segregation into different size components which comprises:

a. a vertically elongated housing,

b. an inlet opening centrally located at the top of said housing,

c. a discharge opening centrally located at the bottom of said housing,

d. a first conical deflector fixed in position beneath said inlet opening adjacent the top of said housing, said first deflector consisting essentially of:

a stationary cone having its apex facing toward said inlet opening,

an annular frusto-conical member fixed concentrically around said cone, the maximum radius of said cone being less than the minimum radius of said member, and

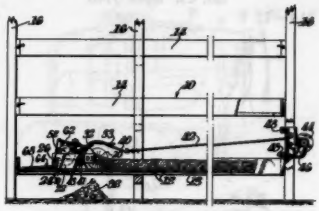
radial vanes extending between said cone and said member holding them in fixed concentric relationship with the top of said member being in substantially the same horizontal plane with the apex of said cone,

e. a second conical deflector fixed in position above said discharge opening adjacent the bottom of said housing, said second deflector constituting means for causing material within the silo to fall evenly therefrom out of the discharge opening.

3,945,512
APPARATUS FOR EMPTYING RECEPTACLES OF PARTICULATE MATERIAL

Robert T. Pannell, Crestline Road, Kennet Square, Pa. 19348

Filed Nov. 27, 1974, Ser. No. 527,888
Int. Cl.² B65G 65/46
U.S. Cl. 214—17 DA 15 Claims



1. In apparatus for emptying an elongated receptacle of particulate matter, said receptacle having a bottom and at least one side, said apparatus having a conveyor comprising a screw, a frame for mounting said screw, said screw being horizontally disposed and adapted to be positioned transversely to the length of said receptacle, a shround cooperating with said screw to effect the lateral transport of said particulate matter, and adapted to engage the bottom of said receptacle, said apparatus comprising, in combination:

first drive means mounted on said frame for rotating said screw, thereby to discharge said particulate material transversely of said receptacle away from said one side and to urge said screw against said one side to be guided thereby,

second drive means effecting a pulling force at a fixed point at the end of said receptacle toward which said screw conveyor is to be moved,

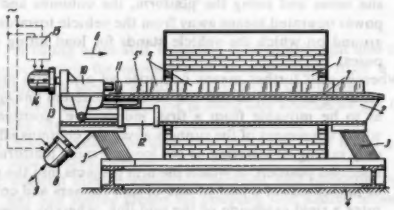
cable linking means interconnecting said second drive means, a frame portion of said screw conveyor and said end of said receptacle for moving said screw conveyor lengthwise of said receptacle, thereby to empty said receptacle, and

auxiliary means for assisting in the steering of said screw conveyor.

3,945,513
GRAVITY DISCHARGE FURNACE FOR HEATING PRODUCTION PARTS

Friedrich Scheffler, Remscheid, Germany, assignor to AEG-Elotherm GmbH, Remscheid, Germany

Filed Aug. 28, 1974, Ser. No. 501,442
Claims priority, application Germany, Sept. 1, 1973, 2344234
Int. Cl.² F27B 9/38
U.S. Cl. 214—23 6 Claims

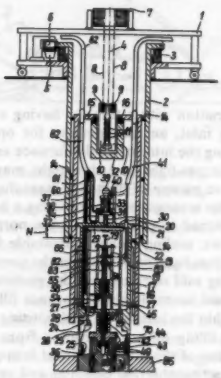


1. In a gravity-discharge oven for heating a large number of production parts, which pass through the oven along slipway on which they lie, the parts being pushed through the oven by means mounted at the entrance to the said oven, for exerting a force upon the nearest part on the slipway to push all of the parts, as a column of parts over a stretch whose length is determined by the stroke of the pushing mechanism, the improvement including a beam, means for attaching said slipway to said beam in such a way that said beam swings, and a vibrator that acts upon said slipway with an acceleration of vibratory motion that has a component perpendicular to the direction of transport of the parts.

3,945,514
GRIPPING APPARATUS OF A LIFTING DEVICE, ESPECIALLY IN A CORE REACTOR FOR SETTING DOWN AND LIFTING FUEL ELEMENTS AND FUEL RODS

Gerhard Dose, Laudenbach, Bergstrasse, Germany, assignor to Fried, Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Feb. 15, 1974, Ser. No. 443,111
Claims priority, application Germany, Feb. 19, 1973, 2308131
Int. Cl.² G21C 19/10
U.S. Cl. 214—27 10 Claims



1. In combination with a gripping and lifting device, for the fuel elements and rod means in a core reactor; a carriage, a winch drum on the carriage, a support member beneath the carriage and cable means suspending the support member from the winch drum, a gripper body having at its upper end an inwardly protruding first abutment which can rest upon said support member and having a lower situated inwardly protruding second abutment, a gripper housing reciprocable within said gripper body having a third abutment which can rest upon said second abutment and having at its lower end a first gripper means for engagement with rod means and a second gripper means for engagement with a fuel element, the rod means being insertable in the fuel element and removable completely independently from the fuel element, a first power operable means arranged within said gripper housing and attached to said gripper housing for actuating said first gripper means, a second power operable means attached to said gripper housing at a higher level than said first power operable means for actuating said second gripper means, locking means for locking said first and second gripper means in gripping positions.

3,945,515

ARRANGEMENT FOR PREVENTING THE ESCAPE OF DUST AND GAS DURING THE FILLING OF A FURNACE

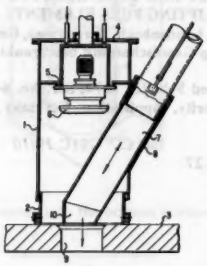
Willi Busbach, Essen, Germany, assignor to Bergwerksverband GmbH, Essen, Germany

Filed July 17, 1974, Ser. No. 489,420

Claims priority, application Germany, July 18, 1973, 2336514

Int. Cl.² F23K 3/00

U.S. Cl. 214—35 R 9 Claims



1. In combination with a furnace having a normally closed furnace filling inlet, an arrangement for opening the filling inlet, then filling the interior of the furnace and then reclosing the inlet all in gas-tight and dust-tight manner in order to prevent the free escape of dust and gases during the filling of the furnace, the arrangement comprising a housing having an opening positioned in proximity to the normally closed furnace filling inlet; sealing means activatable for establishing a gas-tight and dust-tight seal between the portion of said housing surrounding said opening and the portion of said furnace surrounding said normally closed furnace filling inlet in order to confine within the interior of said housing any dust and gas entering said filling inlet or escaping from said filling inlet during the filling of the interior of said furnace; means within said housing activatable for opening and reclosing said normally closed furnace filling inlet; and filling means operative for conveying a charge through the interior of said housing and into said furnace filling inlet, said filling means having a discharge end portion located within said housing gas-tightly and dust-tightly connected to said housing so that dust and gas leaving said discharge end portion but not entering said filling inlet are confined within said housing and are unable to freely escape into the ambient atmosphere, wherein the furnace filling inlet is provided with a removable cover, and wherein said means for opening and reclosing said furnace filling inlet comprises a cover-engaging arrangement movable in a first stroke along a first path into engagement with said cover and operative for then engaging said cover and retractable in an opposite second stroke along said first path with said cover engaged, and wherein said filling means comprises a retractable filling pipe arrangement the discharge end portion of which is located within the interior of said housing, said retractable filling pipe arrangement being mounted for movement along a second path between an operative and an operative position, said first and second paths intersecting so that said filling pipe arrangement cannot move into operative position unless said cover-engaging arrangement is in retracted position, and so that said cover-engaging arrangement cannot perform said first stroke unless said filling pipe arrangement is in retracted position.

3,945,516

VEHICLE LOAD LIFTING AND LOWERING APPARATUS

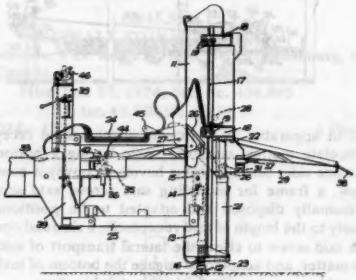
Albert William Peck, and Reginald Stephen Richardson, both of Welwyn Garden City, England, assignors to John Ratcliff (Tail Lifts) Limited, England

Filed May 21, 1974, Ser. No. 472,038

Claims priority, application United Kingdom, May 21, 1973, 24157/73

Int. Cl.² B60P 1/46

U.S. Cl. 214—75 T 4 Claims



1. A vehicle load lifting and lowering apparatus comprising in combination:

a pair of parallel spaced apart guide columns,

a plurality of runners slidably mounted in equal numbers on each of said columns,

a load carrying platform supported between said runners,

means between the columns and the runners for effecting powered up and down sliding movement of the runners along the columns to raise and lower the platform,

a deformable articulated linkage,

means pivotally connecting one end of said linkage to the guide columns,

means pivotally connecting the opposite end of said linkage to the rear of a vehicle to locate the guide columns in a substantially upright position across the vehicle,

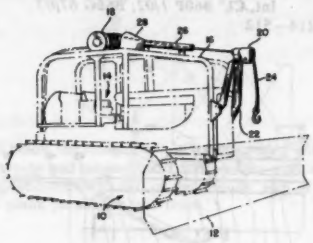
and, further means responsive to powered sliding movement of the runners in one direction along a predetermined length of the guide columns, to deform the linkage and swing the platform, the columns and the power operated means towards the vehicle for storing thereagainst, and responsive to powered sliding movement of the runners along a predetermined length of the guide columns in the opposite direction, to articulate the linkage in the opposite sense and swing the platform, the columns and the power operated means away from the vehicle towards the ground on which the vehicle stands for load lifting purposes,

wherein said further means comprise an arm, with means securing said arm to one link of the articulated linkage so as to be movable from a first, inoperative, position, in which movement of the runners along the columns effects only raising or lowering of the load carrying platform, to a second position, in which the arm projects into the path of movement of a part of one of said runners and constitutes a rigid extension of the said link, whereby powered sliding movement of the runners along the guide columns iss transmitted, via interengagement of the said runner and the projecting arm, to the said link to articulate the linkage in either sense.

3,945,517
TRACTOR-MOUNTED LOGGING WINCH

Wesley B. K. Carley, 2156 Neil St., Victoria, British Columbia, Canada

Filed July 1, 1974, Ser. No. 484,400
Int. Cl.² B60P 1/00
U.S. Cl. 214—85.5 5 Claims



5. A bulldozer vehicle having an operator's station surrounded by a canopy, the improvement comprising:

a powered cable drum secured to said canopy;

a fairlead secured to said vehicle forward of said drum and operator's station;

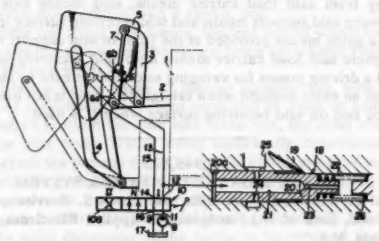
a cable wrapped on said drum and extending directly to said fairlead, said cable further passing through said fairlead to a point forward of said vehicle; and

a guide tube surrounding a portion of said cable intermediate said drum and fairlead, said tube having a flared rearward end.

3,945,518
LIFTING APPARATUS WITH HYDRAULIC OPERATED MEANS TO MOVE A COUNTERWEIGHT THEREON

Kazuo Inoue, Tokyo, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Nov. 21, 1973, Ser. No. 418,024
Claims priority, application Japan, Nov. 24, 1972, 47-117124
Int. Cl.² B66C 23/72; B66F 9/00
U.S. Cl. 214—142 4 Claims



1. A lifting apparatus including a counterweight and a hydraulic circuit for moving said counterweight from a first position to a second position, said circuit comprising:

a. a hydraulic cylinder for moving said counterweight from the first position to the second position;

b. source means for supplying hydraulic fluid under pressure to said cylinder;

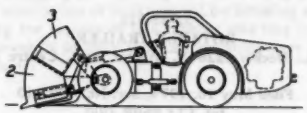
c. conduit means connected between said hydraulic cylinder and source means for coupling said source means to said hydraulic cylinder; and

d. bypass valve means connected to said conduit means and responsive to the pressures therein, for draining a portion of the fluid in said conduit when the hydraulic pressure in said conduit means falls below a predetermined value when the counterweight is in the vicinity of said second position, said bypass valve means comprising a body having a hole therein, a drain port therein coupled to said source means and a spool positioned in said hole in said body, said spool having an axial hole in the center thereof and a radial hole extending from said axial hole to the exterior thereof, wherein when the pressure is below said predetermined value, said spool means moves within the hole in said body, such that said radial hole is aligned with said drain port, such that fluid flows from said conduit through said axial hole, through said radial hole and then through said drain port to said source, whereby the pressure in said hydraulic cylinder is reduced, thereby reducing the speed of movement of said heavy article.

3,945,519
LOADING METHOD

Sven Erik Nore Eriksson, Orebro, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Division of Ser. No. 313,129, Dec. 7, 1972, Pat. No. 3,917,089.
This application June 14, 1974, Ser. No. 479,483
Claims priority, application Sweden, Dec. 16, 1971, 16105/71
Int. Cl.² B65G 65/28
U.S. Cl. 214—152 6 Claims



1. A method of loading, transporting and discharging material obtaining increased capacity comprising:

positioning a scoop to be nested within a load bucket connected to arm means pivotally connected to a load transporting vehicle,

raising and lowering the arm means for selectively positioning the load bucket,

steering the load bucket and scoop therein toward the material to be loaded and loading material into the scoop,

raising the scoop to a raised position by raising the load bucket to a selected position, retaining the scoop in the raised position while lowering the load bucket to unnest the scoop from within the load bucket,

loading material into the load bucket, and transporting the loaded material and discharging the same from the scoop and from the load bucket.

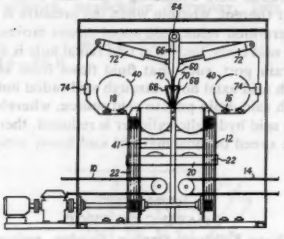
3,945,520
APPARATUS FOR TRANSFERRING DISCRETE LOADS TO OR FROM PALLETS

Frederick George Harman, Epping, England, assignor to The British Mathews Limited, Epping, England

Division of Ser. No. 350,188, April 11, 1973, Pat. No. 3,863,776. This application Jan. 24, 1975, Ser. No. 543,942
Claims priority, application United Kingdom, Apr. 11, 1972, 16736/72
Int. Cl.² B65G 65/04
U.S. Cl. 214—310 2 Claims

1. Apparatus for removing discrete loads from a pallet on which the loads are arranged in two adjacent rows, comprising pallet infeed means for moving a loaded pallet to a loading station, first and second load conveying means adapted to discharge discrete loads from respective first and second loading positions arranged on opposite sides of the loading station, load transfer means adapted to move each of the two

rows of loads simultaneously from a pallet at the loading station onto the respective load conveying means, and pallet



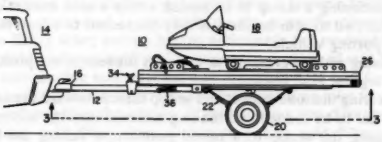
discharge means for discharging an empty pallet from the apparatus.

3,945,521

ROTABLE TRAILER

Warren L. Decker, 228 N. Willow Ave., Centre Hall, Pa. 16828

Filed May 16, 1974, Ser. No. 470,610
Int. Cl.² B60P *3/00*
U.S. Cl. 214—506 **6 Claims**



1. A trailer apparatus adapted to be attached to a towing vehicle having a rotatable and removable bed thereon, comprising in combination:

a wheel supported lower frame having coupling means to be attached to a towing vehicle;

a trailer bed positioned upon said lower frame;

a circular turntable integrally attached to said lower frame;

a plurality of wheels rotably attached to said trailer bed and adapted to engage said turntable;

a center pivot pin integrally attached to the center portion of said bed and adapted to fit into a center hole located in said lower frame;

a hinge plate positioned upon said lower frame;

a tongue attached to said trailing vehicle;

a pin extending through said hinge plate and through said tongue;

a clamp frame rotably attached to said frame;

screw means attached to press said clamp frame against said tongue whereby said clamp frame is pivoted;

a spring loaded pin attached to sid tongue;

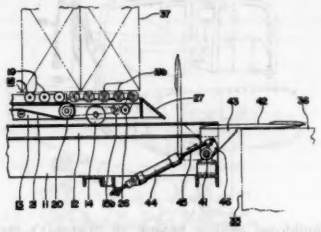
a bed protrusion attached to said bed having an opening therethrough for the insertion of said spring loaded pin means.

3,945,522

APPARATUS FOR LOADING GOODS

Dairi Suizu, and Yasuaki Kato, both of Kakogawa, Japan, assignors to Okura Yusoki Kabushiki Kaisha, Kakogawa, Japan

Filed June 26, 1974, Ser. No. 483,116
Claims priority, application Japan, Dec. 13, 1973, 48-140775
Int. Cl.² B60P *1/02*; B65G *67/02*
U.S. Cl. 214—512 **5 Claims**



1. A loading apparatus for loading goods onto a receiving surface comprising: a horizontally movable carriage, a horizontally disposed support means secured to said carriage, means for elevating said support means, said elevating means including lifting arms pivotably connected in a crisscross manner, said support means mounted above and connected to said carriage by said elevating means, load carrier means supported on said support means, means for supporting said load carrier means and for causing horizontal movement to said support carrier means with respect to load carrier means to convey said load carrier means onto and away from said receiving surface, said load carrier means including a conveyor means forming a conveyor surface, said conveyor means including a plurality of transversely disposed parallel rollers driven by a belt disposed below said rollers in driving engagement therewith, said conveyor means being operable to support said goods and to convey said goods onto said receiving surface as said load carrier means is reciprocated away from said receiving surface, means extending between said support means and said receiving surface for supporting said load carrier means as said load carrier means is conveyed onto and away from said load carrier means, said means extending between said support means and said receiving surface including a guide means provided at the front of said support means to guide said load carrier means onto said receiving surface and a driving means for swinging said guide means so as to be set in an erect position when said guide means is not used and to be laid on said receiving surface when it is used.

3,945,523

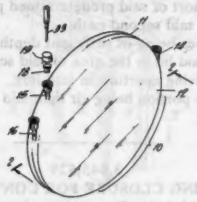
FREEZE STORAGE CONTAINER SYSTEM

Paul T. Wertlake, Short Hills, and James S. Harrison, Ringwood, both of N.J., assignors to Applied Bioscience, Fairfield, N.J.

Continuation of Ser. No. 373,083, June 25, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 567,990
Int. Cl.² B65D *1/00*
U.S. Cl. 215—1 R **2 Claims**

1. A container for use in the rapid freezing of liquids through immersion in liquid refrigerants and in the subsequent storage and processing of the frozen or thawed liquids comprising a hollow, disc-shaped vessel having a volume at least 50 percent greater than that of the liquid to be frozen, said vessel being made entirely of double annealed borosilicate glass having a low coefficient of expansion and consisting essentially of an annular outside wall of uniform thickness and convex cross-section. a pair of substantially flat and parallel faces continuously joined to and integral with the edges of said

annular wall, and three parallel tubular ports in communication with the interior of said vessel and projecting from and integral at one end with the annular wall and terminating at its



other end below the intersection of its axis with a line perpendicular thereto and tangential to said annular wall, said ports being disposed within an arc of the annular wall of less than 180° in a plane parallel to said faces.

3,945,524

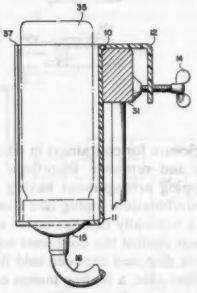
SELF-FEEDING BOTTLE

Eugenia Tkaciukas, 83 Boyden Ave., Maplewood, N.J. 07040

Filed June 21, 1974, Ser. No. 481,641

Int. Cl.² A61J 9/06

U.S. Cl. 215—11 R **2 Claims**



1. A device for use in feeding a baby comprising

a bottle holder fitted with a clamp, and

a bottle top fitted with tubing, the free end of which terminates in a nipple, said bottle top being detachably engageable to a bottle,

said bottle holder being of tubular construction, with one end completely open, said open end of a size to admit a baby's bottle fitted with said bottle top, the other end of the said bottle holder being sufficiently constricted to permit the passage therethru of the tubing attached to the bottle top engageable to the bottle; but small enough to restrain the passage therethru of said bottle top, said bottle holder having an axial length substantially equal to the axial dimension of the bottle to be retained therein said clamp fitted to the bottle holder being of a size to fit about the rail of a crib, and fitted to an external side of the bottle holder.

3,945,525

CLOSURE SYSTEM FOR MEDICAL LIQUID CONTAINER HAVING LOW-TORQUE BREAKAWAY RING

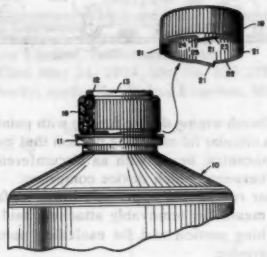
Eugene C. Jones, Los Alamitos, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed June 6, 1974, Ser. No. 477,310

Int. Cl.² B65D 41/32

U.S. Cl. 215—232 **18 Claims**

1. A container for storing and dispensing sterile liquids, said container having a dispensing outlet surrounded by a flange, an externally-threaded cap fitting over the outlet and having an outwardly-projecting brim at its lower end overlying said flange, said brim being sealed to said flange along an annular zone having an inner boundary defining an annular line of weakness of said brim, and an internally-threaded breakaway ring threadedly disposed on said cap, wherein the improvement comprises



said breakaway ring having a plurality of torque-reducing circumferentially-spaced depending projections for slidably engaging and stressing said brim along portions of said annular line of weakness and for initiating and propagating the rupture of said brim as said ring is threaded downwardly to force said cap upwardly away from said container.

3,945,526

CLOSURE CAP

Jack L. Robertson, Jr., 8231 Ellis Ave., Apt. 1C, Huntington Beach, Calif. 92627

Filed Feb. 26, 1975, Ser. No. 553,179

Int. Cl.² B65D 41/04

U.S. Cl. 215—302 **5 Claims**

1. A cap of the type that may be rotated into sealing engagement with an open portion of a container, said cap being characterized by including manually actuated torque applying means as a part thereof to permit sufficient rotationally directed force to said cap to release the latter from a stuck position on said container in which said torque applying means includes:

a. two laterally spaced uprights that extend upwardly from said cap;

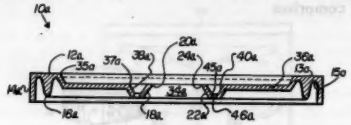
b. an elongate rigid member having first and second ends; and

c. means for removably supporting said member from said cap in a first position substantially parallel to said uprights, with said member capable of being removed from said first position and disposed in a second transverse position where a portion of said member intermediate said first and second ends is disposed between said uprights to permit torque to be applied to said cap to release the latter from a stuck position on said container.

3,945,527
PAINT BRUSH WIPING DEVICE

Andrew A. Pylant, 404 N. Columbia St., Warsaw, Ind. 46580

Filed Oct. 30, 1974, Ser. No. 519,300
Int. Cl.² B65D *25/00, 43/06*
U.S. Cl. 220—90 5 Claims



2. A paint brush wiping device for use with paint cans of the type having a circular lid-attaching portion that includes inner and outer concentric beads with aa circumferential friction groove herebetween, which device comprises:

a. a circular rim having upper and lower surfaces and including means for removably attaching said rim to said lid-attaching portion and for excluding paint from said friction groove;

b. a pair of elongated and substantially straight wiper blades each having a wiping edge thereupon, being disposed with said wiping edges in spaced-apart proximal relationship to each other, and being disposed intermediate of said rim and in substantially planar relationship to said surfaces;

c. a pair of elongated trough portions each being interposed between one of said wiper blades and a proximal portion of said rim, each being in planar relationship to said surfaces, each being in elongated parallel relationship to said wiper blades, each being attached to the proximal one of said wiper blades, each including perforation means for the return of paint from respective ones of said trough portions to said paint can, and each cooperating with one of said wiper blades to form an open trough that opens toward said upper surfaces; and

d. web means, being interposed between said trough portions and said respective proximal portions of said rim and being in substantially planar relationship to said upper and lower surfaces, for securing said wiper blades and said trough portions to said rim.

3,945,528
APERTURED LID AND METHOD FOR MANUFACTURING SAME

Melvin Mowrey, Jr., Reisterstown, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Continuation of Ser. No. 298,519, Oct. 18, 1972. This application Feb. 24, 1975, Ser. No. 552,663
Int. Cl.² B65D *41/02*
U.S. Cl. 220—265 2 Claims

1. A thin-walled plastic closure lid for a container, said plastic characterized by the property of exhibiting stress patterns in areas proximate to cuts in said lid in response to the formation of said cuts, said stress pattern causing the weakening of said plastic in the area thereof, said lid having a frangible portion for selectively providing a straw receiving aperture therein, said fragible portion comprising:

a first continuous score line on a surface of said lid extending along a first path; a second score line on said surface extending along a second path which intersects said first path at a predetermined point, said second score line stopping short of said predetermined point on both sides thereof on said second path;

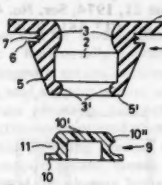
said score lines being of sufficient depth to facilitate puncturing of said lid in the area of said score lines to form a straw receiving aperture in said lid;

said frangible portion being air tight and leak proof prior to puncturing.

3,945,529
SEALING CLOSURE FOR CONTAINERS

Walter Haag, Abstadt, Germany, assignor to Barrel Fresh Service AG., Chur, Switzerland

Filed Aug. 27, 1974, Ser. No. 500,889
Claims priority, application Germany, Aug. 28, 1973, 2343232
Int. Cl.² B65D *39/00*
U.S. Cl. 220—307 8 Claims



1. A sealing closure for containers in which a liquid is stored under pressure and removed therefrom under pressure by means of a tapping arrangement having a breaching spike, comprising in combination, a plug-like closing body having an axial bore and a conically tapered outer side, a flange which is adapted to bear against the container top, said body having an anjular groove disposed between said flange and said conically tapered outer side, a sealing means on said body including at least two ring seals projecting in said bore and axially spaced from each other, an ejectable sealing cap removably mounted in the lower opening of said bore to close said lower opening, as well as a removable closure cap removably mounted in the upper opening of the bore to sealingly close said upper opening, the upper ring seal having a relatively large radius of curvature and being arranged at the upper inner margin of said bore and the lower ring seal being arranged at the lower inner margin of said bore, said removable closure cap being adapted to be penetrated and said sealing cap being adapted to be ejected by said tapping spike when said tapping arrangement is operatively mounted on the sealing closure.

3,945,530
ENCLOSURE FOR ELECTRICAL USE

Robert A. Bozich, Eveleth, Minn., assignor to Malton Electric Company, Virginia, Minn.

Filed Sept. 12, 1974, Ser. No. 505,343
Int. Cl.² B65D *43/06*
U.S. Cl. 220—329 8 Claims

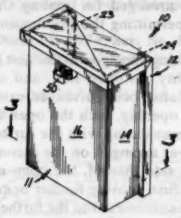
1. In an enclosure for electrical use:

a rectangular box comprising sides, a back, an open top, and an open front bordered by lips turned inwardly from at least said sides;

a cover separable from said box and comprising mutually perpendicular top and front portions;

a pair of internal ramps sloping downwardly backward near the bottoms of said lips;

and a rod extending across the inner surface of said front portion of said cover near the bottom thereof for engaging said ramps to draw said cover against said box when said cover is moved downwardly against said box.



3,945,531

PAY-OUT DEVICES

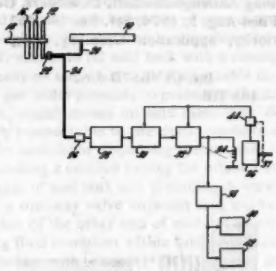
Edward Hugh Clairmonte, New Barnet, England, assignor to Clairmonte Bros., Limited, London, England

Filed Dec. 10, 1973, Ser. No. 423,692

Claims priority, application United Kingdom, Dec. 11, 1972, 57046/72

Int. Cl.[2] B67D 5/08

U.S. Cl. 222—27 15 Claims



1. A bonus or premium dispensing apparatus adapted for use with a machine to permit dispensing of a bonus or premium after preselected operation of said machine, said apparatus comprising:

closed housing means having a plurality of walls defining within said housing means a closed compartment;

a bonus or premium dispensing device attached to one of said walls and disposed exteriorly of said compartment;

pulse generating means adapted for association with said machine for generating a plurality of pulses in dependence upon the operation of the machine;

control means disposed within said closed compartment for counting the pulses generated by said pulse generating means and for actuating the bonus dispensing device upon counting of a predetermined number of pulses which is representative of said preselected operation;

said control means including counting means disposed within said compartment for counting the pulses received from said pulse generating means and for generating an output signal when the count reaches said predetermined number;

said control means further including actuating means disposed within said compartment and responsive to said output signal for actuating the bonus dispensing device to permit dispensing of a bonus or premium, said actuating means and said bonus dispensing device being separated and isolated from one another by one of the walls of said housing means; and

indication means operatively connected to said counting means for continuously indicating when the next bonus or premium is to be dispensed, said indication means disposed as to be visible from the exterior of the housing means.

3,945,532

METERING DEVICE FOR FLOWABLE MATERIALS

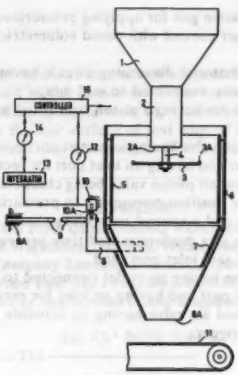
David Alex Marks, Colnworth, England, assignor to Transmatic Fyllan Limited, Bedford, England

Filed May 24, 1974, Ser. No. 473,175

Claims priority, application United Kingdom, May 29, 1973, 25384/73

Int. Cl.[2] B67D 5/14

U.S. Cl. 222—55 6 Claims



1. A metering device for flowable materials comprising:

an element mounted for rotation about a substantially vertical axis;

means for supplying flowable material to said rotary element;

tubular baffle means surrounding said rotary element;

a convergent tubular metering element disposed beneath said baffle means;

means for rotating said rotary element at such speed that flowable material supplied thereto is centrifugally ejected therefrom and intercepted by said baffle means;

said baffle means and metering element being so disposed that substantially all of the material intercepted by the baffle means flows by gravity from its point of interception substantially vertically to the metering element and thereafter flows within the metering element, the material received by the metering element imposing thereupon a force which is a function of the rate of mass flow of the material; and

said metering element being so configured that material can be received thereby from said baffle means around a continuous internal perimeter thereof; and

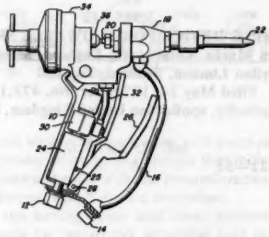
means attached to said metering element externally thereof for supporting said element and detecting changes in at least a component of said force, thereby to provide a signal representing the rate of mass flow of material through the device.

3,945,533

ONE SHOT METERING GUN

Mark O. Otto, Wixom, Mich., assignor to Graco Inc., Minneapolis, Minn.

Filed June 2, 1975, Ser. No. 582,638
Int. Cl.² B05B 9/00; B67D 5/18
U.S. Cl. 222—70 7 Claims



1. An application gun for applying pressurized fluidic material under trigger control with timed volumetric repeatability, comprising:

a. a fluidic material dispensing circuit having an actuable valve therein, connected to said gun;

b. an air cylinder having a piston connected to said actuable valve;

c. an air piston valve having an outlet port connected to said air cylinder and having an inlet port for receiving pressurized air, said air piston valve being characterized by a first open valve position responsive to pressurized air at said inlet port, and a second overriding closed valve position responsive to a predetermined time presence of pressurized air at said inlet port; and

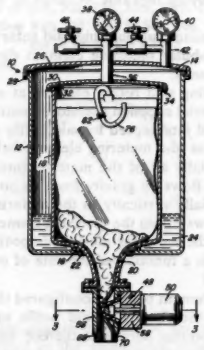
d. an air valve having an outlet connected to said air piston valve inlet port and having an inlet for receiving pressurized air, said air valve having an actuable connection to said gun trigger.

3,945,534

FOOD PREPARATION AND DISPENSING SYSTEM

Esthmel W. Ady, Othello, Wash., assignor to Baker & Ady, Inc., Kennewick, Wash.

Filed Dec. 20, 1972, Ser. No. 316,686
Int. Cl.² B65D 35/56; A23L 1/00
U.S. Cl. 222—105 8 Claims



1. Apparatus for processing and dispensing food, comprising, in combination:

a. a first housing provided with a cavity, an opening, and a further opening, both openings communicating with the cavity, the opening being disposed in a wall of the first housing;

b. a cover pressure withstandingly connected to the first housing and arranged for sealing the further opening thereof and permitting the first housing to be a pressure vessel;

c. a second housing arranged in the first housing and having a further cavity, an open side, and a hollow projecting portion, the latter being arranged extending through the first housing opening, with the open side and projecting portion communicating with the further cavity;

d. a further cover arranged on the second housing for sealing the open side thereof, the open side being disposed adjacent the first housing further opening;

e. passage means connected to the further cover and passing through the cover for permitting communication with the further cavity from outside the first housing;

f. a food package including a bag removably arranged in the second housing and provided with a constricted portion forming a neck terminating in an outlet opening, the bag neck arranged in the projecting portion of the second housing; and

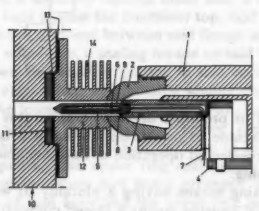
g. a valve assembly connected to the projecting portion and arranged for selectively opening and closing the bag neck.

3,945,535

INJECTION MOLDING APPARATUS

Hans Peter Leiste, Kirchhundem, and Helmut Eckardt, Hilchenbach-Dahlbruch, both of Germany, assignors to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

Filed Aug. 5, 1974, Ser. No. 494,462
Claims priority, application Germany, Aug. 11, 1973, 2340772
Int. Cl.² B67D 5/62
U.S. Cl. 222—146 HE 8 Claims



1. Apparatus for injecting a plasticized material containing a foaming agent into a mold from an extruder, comprising:

a. a channel adapted to carry material from the extruder to the mold, the channel having an inner surface,

b. a nozzle in the channel, the nozzle having a nozzle opening which forms a portion of the channel,

c. a nozzle needle movable through the nozzle opening and having a frontal surface adapted to selectively close the nozzle opening,

d. a heating element adapted to maintain the nozzle needle at a high temperature,

e. a cooling system adapted to maintain at least a portion of the inner surface of the channel at a temperature below that of the nozzle needle, and

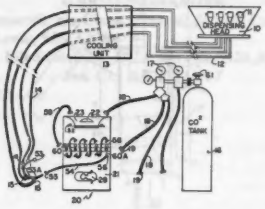
f. carrying means adapted to move the nozzle needle to open and close the nozzle opening.

3,945,536

SANITIZING AND CLEANING DEVICE FOR PRESSURIZED SOFT DRINK SYSTEMS AND THE LIKE

Gerald Doak, 627 Garwood Ave., Winnipeg, Manitoba, Canada

Filed Nov. 11, 1974, Ser. No. 522,462
Claims priority, application United Kingdom, Nov. 16, 1973, 53297/73
Int. Cl.² B67D *1/08*
U.S. Cl. 222—148 14 Claims



1. Apparatus detachably connected to soft drink dispensing systems and the like which include a source of gas under pressure, various drink dispensing conduits normally connected between tanks of post or pre mixed drinks and a dispensing head, said dispensing head including a control tap for each of said conduits for dispensing the drink under pressure provided by the source of gas, said conduits being detachably connected to said tanks by means of conventional quick connector couplings; the apparatus comprising in combination a main tank, means to fill said tank with a rinsing fluid such as water, means on said main tank connectable to the associated source of gas under pressure to pressurize the contents of said main tank, outlet means on said main tank detachably and operatively connectable to the drink conduits and dispensing head of the associated dispensing system, said last mentioned means including a conduit having the intake end thereof adjacent the base of said tank and extending downwardly into said tank, and a one-way valve adjacent said intake end acting in the direction of the other end of said last mentioned conduit, a cleansing fluid container within said main tank, means to fill said container with cleaning fluid, means communicating between said tank and said container whereby when said main tank is pressurized, said container is also pressurized, and an automatic valve assembly within said container controlling said discharge of the associated cleansing fluid in said container to said outlet means of said main tank, means operatively connecting said automatic valve assembly with said outlet means whereby when the associated dispensing head control tap is opened, gas under pressure forces the cleaning fluid from said container into said outlet means and thence through said system, said automatic valve assembly closing off said container from said tank when the contents of said container have been discharged.

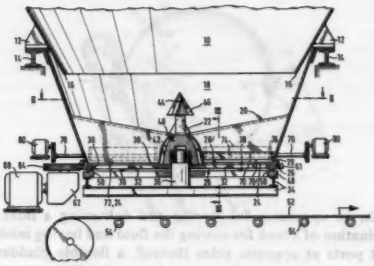
3,945,537

DISCHARGE DEVICE FOR A BUNKER

Peter Langen, 5301 Walberberg, Germany

Filed July 17, 1975, Ser. No. 596,591
Claims priority, application Germany, Feb. 13, 1975, 2506005
Int. Cl.² G01F *11/20*
U.S. Cl. 222—240 17 Claims

1. A discharge device for a loose material bunker for material which has poor flow properties and has a tendency to form bridges, comprising a discharge for arrangement below a conical bunker outlet, the discharge member being rotatable about a vertical axis and being arranged above a base plate having at least one discharge opening, and above the discharge opening fixed cover means is provided, characterised in that the discharge member includes at least one centrally mounted discharge disc driven at its periphery which projects horizontally beyond the lower rim of the bunker outlet and having openings separated from each other by bars, and in that each discharge opening is arranged eccentrically in the



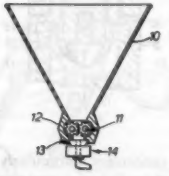
base plate and its cover means extends radially from the bunker outlet wall in the direction of the vertical axis and has adjusting means, operable from the outside, for adjusting the height above the disc surface of that edge of the cover means below which the disc first passes when it revolves.

3,945,538

APPARATUS FOR DISPENSING VISCOUS MATERIAL

John Clifford Wightman, Swansea, Wales, assignor to D. Ayres Jones & Company Limited, Swansea, Wales

Filed Dec. 20, 1974, Ser. No. 534,924
Claims priority, application United Kingdom, Dec. 22, 1973, 59681/73
Int. Cl.² B67D *5/44*
U.S. Cl. 222—333 1 Claim



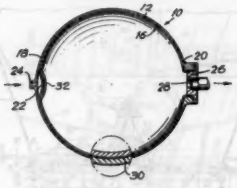
1. A nozzle device for use with apparatus for dispensing pasty food products comprising a hopper and a motor driven pump, including an elongated mounting member adapted to be removably connected to a part of said hopper, a plurality of tubular nozzle drive elements mounted for rotation on spaced parallel vertical axes in said mounting member each nozzle drive element having an open upper end to communicate with the outlet from said pump, and an open lower end formed to act as a nozzle socket, a plurality of nozzles respectively removably located in the said nozzle socket of a corresponding one of said nozzle drive elements, each nozzle having a nozzle orifice which is non-symmetrical about the axis of rotation of said nozzle, a variable speed nozzle drive motor, independent of the motor driving said pump, and drive means connecting said drive motor to each of said nozzle drive elements, to cause simultaneous synchronous rotation of said nozzles.

3,945,539

METHOD AND APPARATUS FOR EXPELLING FLUIDS

Henry J. Sossong, Rockaway, N.J., assignor to Thiokol Corporation, Newtown, Pa.

Filed Aug. 16, 1966, Ser. No. 574,492
Int. Cl.[2] B67D 5/04
U.S. Cl. 222—386.5 6 Claims



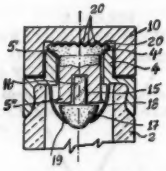
1. In an apparatus for storing and delivering a fluid, the combination of a tank for storing the fluid and having inlet and outlet ports at opposite sides thereof, a flexible bladder attached to the tank between the inlet and outlet ports and of an area to closely fit the wall of said tank, said flexible bladder being movable by a pressure fluid supplied through the inlet from a position where it conforms with one side of the tank to a position where it conforms with the other side of the tank to eject fluid from the tank, and a bonding material adhesively bonding the bladder to the tank wall with a force greater than the force required to flex the bladder whereby to progressively peel the bladder from the tank wall as the bladder is flexed.

3,945,540

VALVULAR LIQUID DISPENSING CLOSURE

Marco Ivanov Mantchev, Rua Cupece 1784, Sao Paulo, Brazil

Filed Oct. 17, 1973, Ser. No. 407,069
Claims priority, application Brazil, Oct. 18, 1972, 7299; Dec. 5, 1972, 8578; May 30, 1973, 4059
Int. Cl.[2] B67D 3/00
U.S. Cl. 222—525 10 Claims



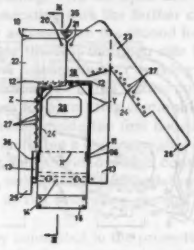
1. A closure for containers, particularly bottles, comprising a closure member mounted on a container and having a passage adapted for alignment with an opening of the container, said closure member forming an outer and an inner valve seat; cap means surrounding said closure member and having a turnable portion which is removable from said container; a plug member freely movable under the influence of gravity in said passage between a first storage position and a second dispensing position, said plug member having an outer valve portion and an inner valve portion respectively engaging said outer and inner valve seats when said plug member is in said first storage position, said outer valve portion having an end facing said turnable portion of said cap means and a polygonal recess at its opposite end, said inner valve portion having a mating stem portion received in said polygonal recess; and cooperating engaging portions on said turnable portion of said cap means and said outer valve portion so that, when said turnable portion is removed from said container, said inner and outer valve portions move relative to their seats so as to break any adherence between said valve portions and their cooperating valve seats.

3,945,541

CLOTH FORMING JIGS FOR USE IN THE MANUFACTURE OF CLOTHING

Nathan Levine, 1, Ferndale Road, Sefton Park, Liverpool, 15, Lancashire, and Eric Leon Levinson, 31, Burnham Road, Allerton, Liverpool, L18 6JU, Lancashire, both of England

Filed Jan. 21, 1975, Ser. No. 542,806
Int. Cl.[2] A41H 33/00
U.S. Cl. 223—38 8 Claims



1. A cloth forming jig, comprising a base plate formed with a cut-out, a forming plate corresponding in shape and size with said cut-out and pivotal from a position clear of said base plate to a position wherein it lies substantially co-planar with said base plate within said cut-out, hinge means attaching said forming plate to said base plate, said means having the axis thereof extending transversely of said base plate and a stop being provided on the underside of said base plate arranged to limit pivotal movement of said forming plate, and a pair of forming arms displaceable on said plate from a position clear of said cut-out to a position wherein they extend beyond the margin of said cut-out, and said forming arms being attached one to each side of the upper part of said base plate on pivots the axes whereof are normal to the plane of said base plate.

3,945,542

CLOTH TUBE EVERTER AND METHOD OF OPERATION

Monte L. Taylor, 955 W. "G" St., Ontario, Calif. 91762

Filed Apr. 24, 1975, Ser. No. 571,315
Int. Cl.[2] A41H 43/00
U.S. Cl. 223—42 17 Claims

1. A device for everting a tube of fabric comprising: an elongated hollow body member; a handle member adapted to be selectively introduced into, or removed from, the immediate vicinity of a first end of said hollow body member; a fabric attachment member adapted to freely pass within the interior of said hollow body to the exterior thereof at either the first or other end of said body member; and means connecting said handle member to said fabric attachment member; said fabric attachment member being further adapted to extend out-

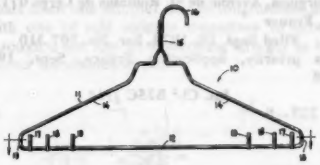
wardly from the other end of said hollow body member after passing through the interior of said hollow body member as the handle member is introduced into the immediate vicinity of said first end of said hollow body member, and to freely pass, in the opposite direction, within the interior of said hollow body member to the exterior thereof at said first end after attachment to a tube of fabric, with said tube of fabric attached thereto.

3,945,543

GARMENT HANGER

Gary G. Lazaroff, c/o Clean Coverall Supply Co., 1317 S. 7th St., St. Louis, Mo. 63104

Filed Nov. 29, 1974, Ser. No. 528,330
Int. Cl.² A47J 51/097
U.S. Cl. 223—88 **1 Claim**



1. A garment hanger for hanging trousers from the waistband loops said hanger comprising:
   a. a substantially peripheral frame including a lower member and opposed upper members, formed from a single length of wire said lower member being substantially straight,
   b. a hook integrally formed with said upper members,
   c. a plurality of upwardly projecting elements welded to the face of said lower frame member and disposed in spaced relation on each side of said hook for receiving selected waistband loops,
   d. said projecting elements being independently formed from single, straight wire lengths of the same diameter as said frame, and
   e. said projecting elements being disposed in a plane parallel to the plane of said frame and said projecting elements being spaced in mirror image of each other relative to the midpoint of the lower frame member and including at least three elements on each side disposed at different intervals.

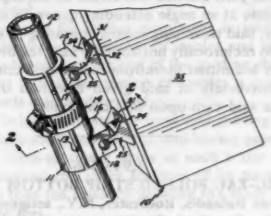
3,945,544

BICYCLE FRAME TOOLBOX

Charles W. Walker, 2204 Harriman, Redondo Beach, Calif. 90278, and Larry K. Larson, 18421 Gaspe Circle, Huntington Beach, Calif. 92647

Filed Sept. 16, 1974, Ser. No. 506,105
Int. Cl.² B62J 9/02
U.S. Cl. 224—32 R **4 Claims**

1. A selectively attached container adapted for installation on a bicycle frame, comprising:
   a split sleeve conformed to receive on the interior thereof a segment of said bicycle frame;
   securing means for compressing said split sleeve onto said frame;
   adapter means disposed on the exterior peripheral surface of said split sleeve including a bore aligned transversely to said sleeve and a slot communicating between said bore and the exterior of said adapter means;
   mounting means securable to said container, including a base member attachable to said container, a projecting element cantalevered from said base member and split pin formed on the free end of said projecting element, said element and said pin being conformed for receipt within said slot and bore respectively, said mounting means further including a nut receiving cavity formed in the juncture of said projecting element and said base member, a nut received within said cavity, a first bolt hole formed in said base member in alignment with said nut,



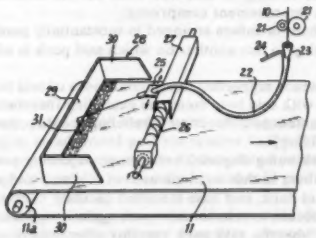
a second bolt hole formed in said container in alignment with said first bolt hole, and a bolt inserted through said first and second nut holes to engage said nut and said pin includes a slot extending longitudinally across an end segment thereof, an end cap on the other end thereof, and a projecting lip extending from the free edge of the bolted end of said pin, the projecting dimensions of said lip being less than the gap dimensions of said slot.

3,945,545

METHOD AND APPARATUS FOR FORMING A YARN WEB ON A CONVEYOR

Bruno Bacro, Ribemont, France, assignor to Societe Nouvelle de la Teinturerie de la Chaussee Romaine, St. Quentin, France

Filed Sept. 23, 1974, Ser. No. 508,353
Claims priority, application France, Sept. 27, 1973, 73.34627
Int. Cl.² B65H 17/32
U.S. Cl. 226—97 **5 Claims**



1. Apparatus for producing a yarn web comprising yarn supply means for feeding therefrom yarn in a longitudinal direction, an elongated tubular guide member having a hollow interior through which said yarn passes, said tubular guide member including an entry end through which yarn is introduced thereinto and a delivery end from which said yarn is emitted, said tubular guide member being formed from flexible material throughout its length at least between said entry end and said delivery end, means holding said entry end fixed relative to said yarn supply means to enable feeding of yarn therefrom into said entry end, a horizontal planer conveyor moving in a given linear direction beneath said delivery end for having said yarn emitted from said delivery end accumulated thereon to form said yarn web, pneumatic means for injecting compressed air flow through said tubular guide member toward said delivery end for projecting said yarn through

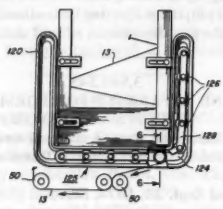
said guide member and out of said delivery end, a fixed deflector plate located proximate said delivery end above said horizontal conveyor and arranged to be upstanding therefrom in a generally vertical arrangement, said fixed plate including a central wall extending across said conveyor transversely of said given linear direction of movement and a pair of end walls entending generally parallel to said given direction, and traversing means having said delivery end mounted thereon to direct said yarn emitted therefrom to impinge said fixed deflector plate at an angle extending generally obliquely to said conveyor, said traversing means operating to move said delivery end to reciprocally horizontally vary the direction in which said yarn is emitted therefrom across said conveyor in directions transversely of said given direction of movement to distribute said yarn upon said conveyor.

3,945,546

ZIG-ZAG FOLDED STRIP BOTTOM FEEDER

Leo Steven Balandis, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 25, 1974, Ser. No. 508,923
Int. Cl.² B65H *17/00*
U.S. Cl. 226—118 **10 Claims**



1. A pack tray for supporting an endless web fanfolded into a pack for feeding of said web from off the bottom of said pack, the improvement comprising:

plural base members arranged in substantially parallel relationship to one another on which said pack is adapted to rest;

track means supporting the terminal ends of said base members with said base members extending therebetween for movement in a direction paralleling the direction of web unfolding,

said web being disposed between an adjoining pair of said members so that on movement of said web and unfolding of said pack, said base members oscillate back and forth, and means to restrain said pack against oscillation in said tray whereby said pack remains substantially stationary during oscillation of said base members as said pack unfolds.

3,945,547

TRACTIVE APPARATUS

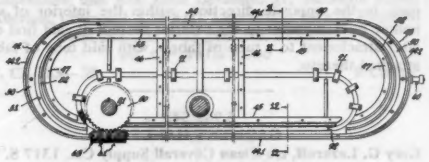
Harry C. Ledebur, Canfield, Ohio, assignor to Wean United Inc., Pittsburgh, Pa.

Continuation of Ser. No. 25,418, April 3, 1970. This application Apr. 26, 1974, Ser. No. 464,542
Int. Cl. B65h *17/24*
U.S. Cl. 226—172 **20 Claims**

1. A tractive device for gripping elongated stock and for exerting a force thereon longitudinally thereof, the improvement comprising:

a plurality of tractive members circulating in a closed path toward and away from successive engagement with said stock,

and means removably secured to each member by magnetic attraction and providing a replaceable stock-engaging face.

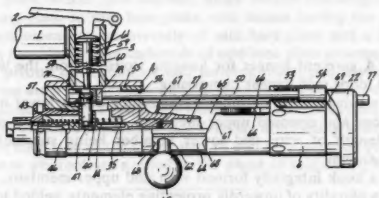


3,945,548

PISTON ACTUATED FASTENING GUN

Roger Dorgnon, Avenue de St. Romains de Lerps 07130, Saint Peray, France

Filed Sept. 19, 1974, Ser. No. 507,310
Claims priority, application France, Sept. 19, 1973, 73.33548
Int. Cl.² B25C *1/14*
U.S. Cl. 227—8 **5 Claims**



1. A powder-actuated fastening gun including a housing, a barrel assembly mounted in said housing for movement between a locked position and an unlocked forward position, percussion assembly means in said housing for initiating the ignition of a powder charge and moveable between a firing position and a fired position, a rod member external of said barrel assembly, said rod member being moveable between a forward position and a rearward position, means releasably connecting said percussion assembly means and said rod member, means projecting from said barrel assembly to engage said rod member and move it from its forward position to its rearward position as said barrel assembly is moved from its unlocked to its locked position, and means for disconnecting said percussion assembly means and said rod member only when said rod member is in its rearward position.

3,945,549

AUTOMATIC STITCH NAILING APPARATUS

Donald W. Colson, Minneapolis, Minn., assignor to Viking Pallet Corporation, Osseo, Minn.

Filed Sept. 20, 1974, Ser. No. 507,960
Int. Cl.² B27F *7/02*
U.S. Cl. 227—45 **25 Claims**

1. An automatic nailing apparatus for nailing transverse slats to spaced parallel stringers, said nailing apparatus comprising:

a. an elongated frame having a transversely extending frame member overlying said frame;

b. a plurality of stringer magazines for vertically stacking a plurality of stringers to extend longitudinally of said elongated frame at spaced parallel positions transversely thereof;

c. first conveyor and guiding means for advancing and simultaneously guiding a lowermost one of said vertically stacked stringers from each of said stringer magazines longitudinally of said elongated frame;

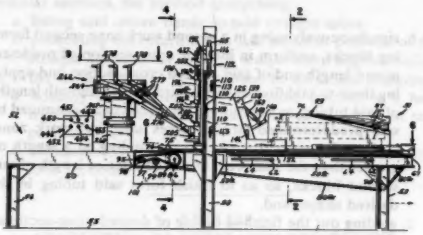
d. a slat magazine for vertically stacking a plurality of slats to extend transversely of the stringers between said transverse frame member and said plurality of stringer magazines;

e. second conveyor means for advancing and positioning a lowermost one of said vertically stacked slats onto said advancing stringers;

f. nailing means mounted on said transverse frame member and generally above said first conveyor means, for automatically nailing a slat to each of said advancing stringers, said nailing means including:

i. a plurality of nailing heads, each of said nailing heads having a hydraulically actuated hammer member for individually driving a nail into a slat positioned therebeneath;

ii. each of said nailing heads being transversely spaced apart from one another and in longitudinal alignment with one of said stringer magazines to drive a nail through a slat into an underlying stringer as it is positioned therebeneath; and



iii. each of said nailing heads being maintained in a fixed longitudinal and lateral position during the automatic operation of that nailing apparatus; and

g. control means:

i. for selectively advancing and momentarily stopping said first conveyor means to uniformly advance the lowermost ones of the stacked stringers to a position beneath said nailing heads where said first conveyor means may be momentarily stopped with a slat positioned beneath each said nailing head while a nail is driven by the hammer elements;

ii. for periodically actuating said second conveyor means, responsive to positional advancement of said first conveyor means, to advance and position said lowermost stacked slat onto said advancing stringers and subsequently to a position beneath said nailing heads; and

iii. for actuating said nailing means in cooperation with the momentary stopping of said first conveyor means, to simultaneously energize each of said nailing heads at least one time, thereby driving a nail through the slats into each of the underlying stringers, and to then allow said first conveyor means to advance.

3,945,550

STAPLE-FEEDING MAGAZINE FOR A STAPLER

Umberto Monacelli, Via Parini 6, Monza, Milan, Italy

Filed Nov. 12, 1974, Ser. No. 523,131

Claims priority, application Italy, Nov. 12, 1973, 31219/73

Int. Cl.² B25C 5/16

U.S. Cl. 227—126 **12 Claims**

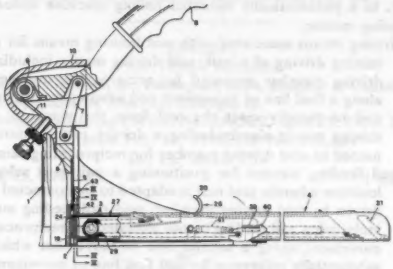
1. A staple-feeding magazine for a stapler of the kind comprising a driving channel, a staple-ejecting driver, means for controlling a reciprocation of active and return strokes of the driver within the driving channel, and a feeding magazine connected to the driving channel so as to feed a succession of metallic staples individually one after the other to said driving channel, said magazine also comprising

a baseplate,

means defining an elongate guiding channel intended to support and to guide a succession of staples, said guiding channel being formed on said baseplate and being open at both ends to form staple loading and feeding ends, respectively, and to progressively guide said staples to the driving channel,

a follower mounted for sliding movement in said guiding channel behind said succession of staples and resiliently urged towards said feeding end of the guiding channel so as to impart to said succession of staples a continuous thrust towards said feeding end,

said follower being withdrawable from said guiding channel through said loading end thereof, and having generally an inverted-U cross-sectional shape of such a size that the distance between the outer surfaces of its parallel side walls is less than the distance between the inner surfaces of the staple legs,



the open, rear, staple loading end of the guiding channel being in an advanced position relative to the corresponding rear end of the baseplate so that an end portion of said baseplate projects rearwardly beyond said guiding channel, and

cooperating anchoring means provided on said follower and on said end portion of said baseplate, respectively, and releasably engageable, when said follower is removed from the guiding channel, to anchor said follower to said end portion of the baseplate in a position in which said follower remains within the overall contour of the magazine and above said baseplate and said end portion thereof, but in a lowered position which allows its transverse wall portion between said side walls thereof to leave clear said rear end of the guiding channel to permit insertion of a succession of staples in the guiding channel,

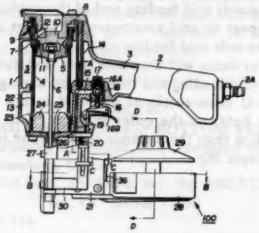
one of said anchoring means comprising an upright member affixed to said end portion of the baseplate and extending upwardly therefrom to a height beneath the horizontal portion of the guiding channel and having in its rear end at least one notch which is engageable with the anchoring means on said follower, when the follower is removed from its guiding channel, to anchor said follower in said lowered position.

3,945,551

NAILING MACHINE

Tutomu Sato; Kiyomi Horikawa, both of Takasaki; Masayoshi Hiroi, Fukushima; Shigeyuki Umino, Maebashi; Toshio Yamada, Takasaki; Takashi Takayama, Takasaki, and Toru Kayamori, Takasaki, all of Japan, assignors to Max Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 9, 1974, Ser. No. 496,006
Int. Cl.² B25C 1/04
U.S. Cl. 227—136 6 Claims



1. In a pneumatically operated nailing machine including housing means;

driving means associated with said housing means for permitting driving of a nail, said driving means including a driving member mounted for reciprocating movement along a first line of movement and adapted for driving a nail to thereby eject the nail from the machine, said driving means also including a driving piston interconnected to said driving member for reciprocating same;

nail feeding meeans for positioning a nail in a selected location wherein said nail is adapted to be contacted and driven by said driving member, said nail feeding means including a nail feeding piston mounted for reciprocating movement along a second line of movement which is substantially transverse to said first line of movement;

means for supplying a pressurized gaseous fluid to each of said pistons for controlling the reciprocation thereof; and

manually movable trigger-controlled valve means mounted on said housing means, first passage means for supplying pressurized fluid to said trigger-controlled valve means, and second passage means for supplying pressurized fluid from said trigger-controlled valve means to said driving piston and said nail feeding piston for causing movement of said pistons, said second passage means including first and second passageways for controlling flow of pressure fluid to said driving piston and said nail feeding piston respectively, comprising the improvement wherein shiftable exhaust valve means is associated with said second passageway, said shiftable exhaust valve means permitting an advancing chamber associated with said nail feeding piston to be selectively disposed in communication with an exhaust passage which communicates with the surrounding atmosphere.

3,945,552

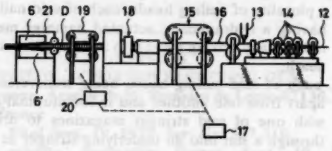
METHOD AND APPARATUS FOR FORMING A CORRUGATED WAVEGUIDE

Susumu Tobita, Ichihara; Masashi Shimoishizaka, Yokohama; Yuzo Sumita, Ichihara; Isamu Oishi, Yokohama, and Koji Kato, Ichihara, all of Japan, assignors to Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1974, Ser. No. 531,225
Int. Cl.² B23K 1/20
U.S. Cl. 228—17.5 8 Claims

1. A method of forming a corrugated waveguide of longitudinal uniformity from corrugated tubing of circular cross-section comprising the steps of:

a. using in a first work zone, opposed first forming blocks, outwardly tapered in elongation within the block interior, said blocks having a desired cross-sectional configuration, and applying said blocks to a first length of tubing at one end of said tubing so as to form said tubing approximately in the desired cross-sectional shape, removing said blocks from said first length of the tubing, advancing the first lengths of tubing to which said first blocks have been applied, by a predetermined stroke, applying said blocks to a second length adjacent to said first length and continuing said operation with third, fourth and nth lengths of tubing;



b. simultaneously using in a second work zone second forming blocks, uniform in interior cross-section of predetermined length and of said desired cross-section and applying them to said first, second, third, fourth and nth lengths of said tubing, as said tubing which has been advanced by said predetermined stroke leaves said first work zone, said predetermined stroke corresponding to a length no greater than the said predetermined interior length of said second blocks, so as to finish form said tubing in the desired shape; and,

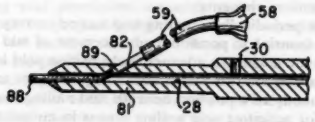
c. guiding out the finished tubing of desired cross-sectional configuration.

3,945,553

SOLDER IRON TIPS

Joseph T. Nicosia, 13 Hileen Drive, Kings Park, N.Y. 11754

Filed Nov. 8, 1973, Ser. No. 414,166
Int. Cl.² B23K 3/02
U.S. Cl. 228—20 19 Claims



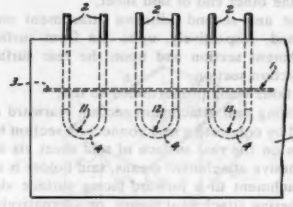
1. A tip for a soldering iron in which the tip is an elongated generally cylindrical member of heat conductive material, said tip having an active end for placement adjacent an area where solder is to be melted and another end adapted for connection to a solder iron for heating the tip, a single bore only for substantially uniform diameter throughout formed axially in said tip extending along at least a portion of the length thereof and having an opening at the active end of the tip, said tip also formed with a vent passage which extends from the outer surface of the tip at a point spaced from the active end through at least a part of said tip to communicate with said bore and a piece of wire braid material extending through said vent passage into said bore and out of the active end of the tip to provide a plurality of capillary passages to molten solder.

3,945,554

ULTRASONIC SOLDERING PROCESS

Charles Louis Osterkorn, North Brunswick, and Salvatore M. Marino, East Brunswick, both of N.J., assignors to Fedders Corporation, Edison, N.J.

Filed June 12, 1975, Ser. No. 586,203
Int. Cl.² B23K 1/06
U.S. Cl. 228—110 6 Claims



1. A process for ultrasonically soldering thin-wall metal tube bundles consisting of straight tubular sections and return tubular sections, the method comprising:

a. fitting said return bends to said straight tubes;

b. preheating the return bends and adjacent portions of the straight tubes to an average temperature approximating the temperature to be employed in ultrasonic soldering;

c. soaking said preheated tube bundle portion in a heat transfer liquid so as to equalize the temperature of said portion; and

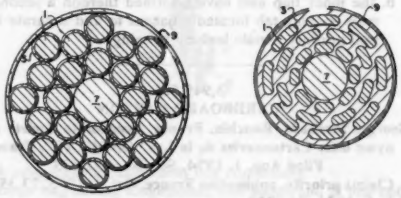
d. ultrasonically soldering said return bends to said straight tube sections.

3,945,555

PRODUCTION OF BERYLLIUM REINFORCED COMPOSITE SOLID AND HOLLOW SHAFTING

Richard Schmidt, McLean, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 256,491, May 24, 1972, abandoned. This application Mar. 17, 1975, Ser. No. 559,360
Int. Cl.² B23P 3/14
U.S. Cl. 228—126 5 Claims



1. A method of forming a shaft comprising:

forming beryllium rods;

cladding the beryllium rods with a metal selected from the group consisting of aluminum and titanium;

arranging the clad beryllium rods around a hard central mandrel selected from a material which resists deformation to a far greater degree extent than said clad rods at a given temperature and which has a diameter appreciably greater than the diameter of each of said rods and into a configuration having a substantially circular cross-section to make a preform;

enclosing the preform within a cylindrical steel can;

heating and reducing the preform including converting the beryllium rods under pressure into arcuate ribbons spaced from each other and from other arcuate ribbons to form a composite shaft; and

removing the shaft from the steel can.

3,945,556

FUNCTIONAL ALLOY FOR USE IN AUTOMATED SOLDERING PROCESSES

Howard H. Manko, Teaneck, N.J., assignor to Alpha Metals, Inc., Jersey City, N.J.

Filed Feb. 25, 1975, Ser. No. 552,808
Int. Cl.² C22C 13/00
U.S. Cl. 228—263 5 Claims

1. In the process of machine soldering a workpiece by application thereto of liquid solder from a molten reservoir; the improvement wherein:

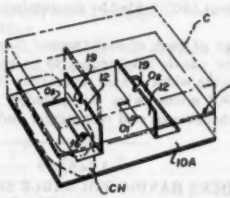
said solder is an alloy consisting essentially of from about 50 to 57.5% by weight tin, from about 1.5 to 4% by weight antimony, and the balance being substantially lead.

3,945,557

PARTITION DIVIDER

James R. Graham, Jr., Davenport, Iowa, assignor to Container Corporation of America, Chicago, Ill.

Continuation-in-part of Ser. No. 354,922, April 27, 1973. This application Feb. 10, 1975, Ser. No. 548,191
Int. Cl.² B65D 3/24
U.S. Cl. 229—15 1 Claim



1. A partition divider formed from a cut and scored blank of flat sheet material such as paperboard or the like comprising:

a. a flat blank;

b. at least one partition divider erectable from the plane of said blank comprised of:

c. a partition member and a partition position maintaining member defined by first cut lines and laterally spaced second cut lines normal to said first cut lines;

d. said partition member and said partition position maintaining member being further defined by a common hinge line formed in the material of the blank and extending continuously between said laterally spaced second cut lines;

e. said partition member being rotatable independently of said partition position maintaining member about said common hinge line out of the plane of said blank through an angle of approximately 90° to an erected position;

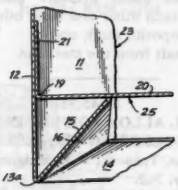
f. said partition position maintaining member being rotatable independently of said partition member about said common hinge line in the same direction through an angle of approximately 180° and into the opening resulting from the rotation of said partition member to maintain the erected position of said partition member.

3,945,558

PAPERBOARD BULK BIN

Jerome Earl Elder, Minneapolis, Minn., assignor to International Paper Company, New York, N.Y.

Filed Nov. 19, 1974, Ser. No. 525,050
Int. Cl.² B65D 5/32
U.S. Cl. 229—23 R 14 Claims



1. A paperboard bulk bin, comprising:

a side wall formed from a plurality of alternating, foldably connected, substantially rectangular, upstanding side panels and corner panels; each of said side panels having a horizontally disposed, substantially rectangular flap, foldably connected to the bottom edge thereof; each of said corner panels having a horizontally disposed, four-sided, tapered flap foldably connected to the bottom edge thereof; and each of said tapered flaps and said rectangular flaps being foldably connected to a triangular gusset panel, horizontally disposed between them; and

a bottom wall formed from a substantially flat, horizontally disposed panel insert having a perimeter corresponding to the bottom edges of said side and corner panels and overlying said rectangular and tapered flaps and said gusset panels;

the included angle in each of said gusset panels between said rectangular flaps and said tapered flaps being equal to about 180° divided by the number of said gusset panels; and

the edge of each of said tapered flaps connected to said corner panels being equal to or greater in length than twice the width of said rectangular flaps times the cosine of [90° minus twice the included angle in said gusset panels between said rectangular and tapered flaps].

3,945,559

HOLDERS HAVING FOLDABLE SHEET SUPPORT

Richard G. Krautsack, Arlington Heights, Ill., assignor to The Cooperative Marketing Co., Elmhurst, Ill.

Continuation-in-part of Ser. No. 464,855, April 29, 1974, Pat. No. 3,881,649. This application Mar. 17, 1975, Ser. No. 559,167
Int. Cl.² B65D 5/06
U.S. Cl. 229—38 10 Claims

1. A holder or the like for presenting an assemblage of items to be taken therefrom on a one-by-one basis, which holder comprises

a generally planar foldable support sheet having a plurality of parallel fold lines and first and second adhesive attachment means so disposed that said support sheet can be attached to differently oriented surfaces,

said support sheet comprising a lower main portion and an upper support portion including an attachment section and a connection section, all of which are defined by said fold lines, said main portion being located at one end of said sheet and being designed to carry the assemblage of items, said attachment section being hinged to said main portion and said connection section being located adjacent the other end of said sheet,

said first and second adhesive attachment means being disposed, respectively, upon the front surface of said attachment section and upon the rear surface of said connection section

said sections being proportioned so that

by folding said attachment section rearward about 180° and by connecting said connection section to one location on the rear surface of said sheet via said second adhesive attachment means, said holder is adapted for attachment to a forward-facing surface via said first adhesive attachment means, or alternatively

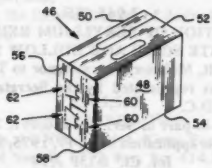
by folding said support portion rearward in a different orientation, said holder is adapted for attachment to a differently oriented surface.

3,945,560

PACKAGE LOCK

Glen R. Harrelson, Gulf Breeze, Fla., and Earle C. Sherman, West Monroe, La., assignors to Olinkraft, Inc., West Monroe, La.

Filed Jan. 20, 1975, Ser. No. 542,153
Int. Cl.² B65D 5/04, 75/08
U.S. Cl. 229—40 21 Claims



1. In a folding carton package of the type having an inner and an outer flap double locked together, said flaps having an elongated edge thereon, the improvement comprising:

a. the inner flap having formed thereon a primary female locking opening adjacent to the edge of the inner flap; and

b. the inner flap also having formed thereon a secondary male locking tab located adjacent to and separate from said primary female locking opening.

3,945,561

CARDBOARD CARTON

Georges Strebelle, Ronchin, France, assignor to Societe Anonyme dite: Cartonneries de la Lys "ONDULYS", France

Filed Aug. 1, 1974, Ser. No. 493,853
Claims priority, application France, Oct. 1, 1973, 73.35593; Feb. 6, 1974, 74.4750
Int. Cl.² B65D 5/36
U.S. Cl. 229—41 B 11 Claims

1. A blank for a collapsible carton, comprising a sheet of carton material, said sheet having;

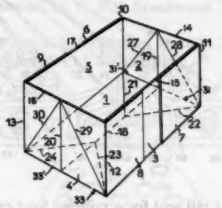
a plurality of panel members constituting outer parts of the sheet;

a convex-polygonal base member constituting a central part of the sheet;

a system of hinge lines, each defining a side of one of the panel members and a side of the base member coincident

with the panel side, to enable turning the panel members about the hinge lines for setting up a carton; and

a system of fold lines extending over surfaces of said base member and of several of said panel members, said system including (a) a primary fold line coinciding with a center line of the sheet, (b) a number of secondary fold lines extending into the base member, one between each corner of the base member and a point on the first fold line diagonally spaced from the respective corner, and (c)



a similar number of tertiary fold lines diagonally extending across panel members, each connecting as intersection of the first fold line and of one outer edge with an adjacent corner of the base, to enable repeated twisting of the members over which the fold lines extend, relative to the fold lines, with localization of resulting constraints in the fold lines, for collapsing the set-up carton into a flat sheet unit and for unfolding said unit to again set up the carton.

3,945,562

CROSS-BOTTOM BAG AND METHOD OF MAKING SAME

Friedrich Franz Brockmüller, Lengerich, Germany, assignor to Windmoller & Holscher, Lengerich, Germany

Filed Oct. 17, 1973, Ser. No. 407,090

Claims priority, application Germany, Oct. 10, 1972, 2251395

Int. Cl.² B65D *31/14*

U.S. Cl. 229—62.5 **12 Claims**

1. A composite cross-bottom bag comprising:

an outer bag having longitudinal side edges and at one end a cross-bottom folded closure having a cross-bottom fold center line extending transversely between the longitudinal side edges of said outer bag, said outer bag being in a flattened condition with said cross-bottom closure lying snugly against the body thereof; and

an inner bag disposed within said outer bag and secured thereto, said inner bag being folded back on itself to define a lower fold line, said lower fold line being positioned at a selected location between the cross-bottom fold center line and the other end of said outer bag.

3,945,563

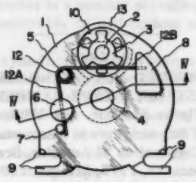
TRANSFER PINION CARRIER PLATE FOR ODOMETERS

Shiro Inoue, Ageo, Japan, assignor to Kabushiki Kaishya Inoue Seisakushyo, Ageo, Japan

Filed Jan. 10, 1975, Ser. No. 540,217

Int. Cl.² G01C *22/00*; G06C *7/10*

U.S. Cl. 235—96 **1 Claim**



1. A transfer pinion carrier plate for an odometer having a plurality of figure wheels rotatably mounted on an odometer shaft and spaced apart from each other at a predetermined distance, said carrier plate being constructed of plastic material and having a central opening surrounding the odometer shaft, a transfer pinion, a circular opening surrounding the transfer pinion, a pocket formed integrally with said carrier plate behind said circular opening having a shaft integral therewith for supporting the transfer pinion, a coil spring yieldably engaging with said transfer pinion, a thick tubular portion projecting rearwardly behind the central opening, slotted arms for holding the carrier plate from rotation and an arcuate bridge portion integral with said carrier plate, wherein said bridge portion extends over said transfer pinion between adjacent figure wheels.

3,945,564

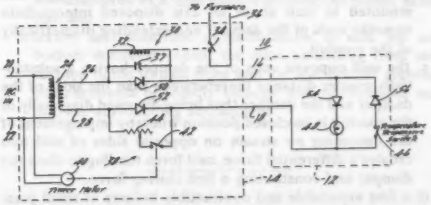
TEMPERATURE CONTROL SYSTEM

Jon Smallegan, Ann Arbor, Mich., assignor to Novo Products, Inc., Farmington, Mich.

Filed June 24, 1974, Ser. No. 482,448

Int. Cl.² G05D *23/30*

U.S. Cl. 236—46 E **19 Claims**



1. A system for controlling temperature at a first location from a remotely located second location utilizing a source of time varying electrical energy which alternates between two directions of current flow and two conductors extending from said first location to said second location comprising:

a first system portion located at said first location including temperature responsive means for responding to the temperature at said first location and a heat source in heat transfer relationship with said temperature responsive means for heating said temperature responsive means;

a second system portion located at said second location including control means for said heat source and a temperature control means for controlling the temperature at said first location; and

steering circuitry means for receiving said time varying electrical energy and for connecting said heat source control means to said heat source and said temperature responsive means to said temperature control means only

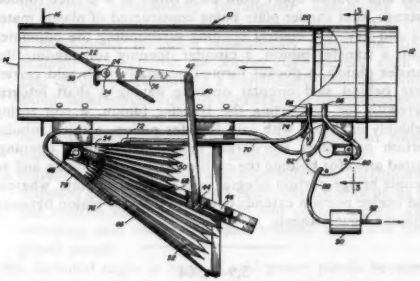
through said two conductors, said steering circuitry means providing a first time period of said time varying electrical energy exclusively to said heat source control means and said heat source and a second time period of said time varying electrical energy exclusively to said temperature control means and said temperature responsive means for providing independent control of said heat source by said heat source control means and said temperature control means by said temperature responsive means.

3,945,565

SYSTEM POWERED ACTUATING MEANS FOR BUTTERFLY TYPE DAMPER

John F. Lynch, Clarks Summit, and William J. Waeldner, Waverly, both of Pa., assignors to Anemostat Products Division Dynamics Corporation of America, Scranton, Pa.

Filed June 25, 1975, Ser. No. 590,059
Int. Cl.² F24F 7/00; F16K 31/165
U.S. Cl. 236—49 **10 Claims**



1. The combination comprising:

a. a conduit having inlet and discharge ends respectively for receiving a supply of air under pressure and for delivering the air at a lower pressure toward an area of use,

b. a butterfly type damper disposed in said conduit and mounted to turn about an axis disposed intermediate opposite ends of the damper and extending diametrically of the conduit,

c. the said opposite ends of the damper having a substantially greater distance therebetween than the sides of the damper and the damper thus being disposed diagonally of the conduit in its closed position whereby impingement of the oncoming air stream on opposite sides of said axis creates a differential force, said force tending to close the damper and constituting a first closing force,

d. a first expansible and contractible bellows of small pressure area having one wall fixed and a second wall movable and connected with said damper to provide a second damper closing force,

e. first air passageway means connecting the interior of said bellows with said conduit upstream of said damper for a supply of air under pressure to said bellows,

f. a second expansible and contractible bellows substantially larger in pressure area than said first bellows and having one wall fixed and a second wall movable in opposition to said first bellows and connected with said damper to provide a damper opening force,

g. second air passageway means connected with said second bellows,

h. a controller connected with said second air passageway means and operable to control air pressure in said second bellows and thereby to control damper position,

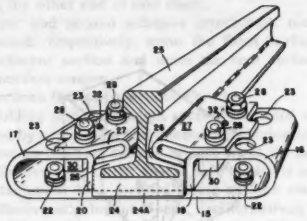
i. and third air passageway means connected between said controller and said conduit upstream of said damper for a supply of air under pressure to said bellows.

3,945,566

SPRING RAIL PLATE FASTENERS FOR DIRECT RAILROAD TRACK FIXATION

Charles J. Bush, Wood Ridge, N.J., assignor to New York City Transit Authority, Brooklyn, N.Y.

Filed Sept. 23, 1974, Ser. No. 508,149
Int. Cl.² E01B 9/30
U.S. Cl. 238—349 **11 Claims**



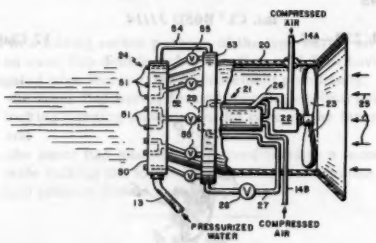
1. A resilient rail seat for a railroad load carrying rail comprising: a spring plate secured to a foundation by anchor bolts and including turned over cantilevered end portions having vertical shoulder portions for retaining the rail against side slip; an elastomeric pad positioned between a base portion of the spring plate and the bottom of the rail, the pad formed with a plurality of spaced vertical air compartments for increasing the flexibility of the pad, each said air compartment being open at one side of the pad, the pad also formed with two side extensions for folding around the two base flanges of the rail; and two shoulder extension clips, secured to the cantilevered end portions of the spring plate for retaining the two extensions of the pad in contact with the rail flanges.

3,945,567

SNOW MAKING APPARATUS

Gerry Rambach, P.O. Box 213, Franconia, N.H. 03580

Filed July 17, 1975, Ser. No. 596,961
Int. Cl.² F25C 3/04
U.S. Cl. 239—14 **23 Claims**



1. A device for making artificial snow comprising

means responsive to compressed air supplied thereto for moving air external to said device through said device from an input to an output thereof, said external air being at ambient temperature and pressure, and said air moving means further having exhaust air produced therefrom;

means responsive to compressed air supplied thereto and to water supplied under pressure thereto for forming a mixture of said compressed air and said pressurized water;

first means responsive to said mixture and to said exhaust air for combining said mixture and said exhaust air to form a combined stream thereof;

second means for further combining said stream with said external air moving through said device, the combination

of said stream and said external air thereupon exiting from said device at said output thereof; and

means responsive to water supplied under pressure thereto for producing a spray of pressurized water external to said device at said output thereof and for directing said spray into contact with the combination of said stream and said external air exiting from said device at said output to produce artificial snow.

3,945,568

SCENTED CHRISTMAS TREE ORNAMENT

William E. Bychowski, 16 W. 038 Brookwood, Bensenville, Ill. 60106

Filed Nov. 13, 1974, Ser. No. 523,229
Int. Cl.² A47G *33/08*
U.S. Cl. 239—57 **1 Claim**

1. An ornament intended for use on a Christmas tree and adapted to receive an odor emitting substance therein, the ornament comprising, in combination:

a top member formed of a hollow hemi-spherically shaped body member including an interior surface, an exterior surface, and a peripheral surrounding bottom edge surface;

a hemi-spherically shaped compartment defined interiorally of said top member interior surface and opening out of a base thereof defined between said peripheral surrounding bottom edges;

a multitude of circular spaced apart perforations disposed in said top member body member placing said top member compartment in communication with the surrounding atmosphere;

a bottom member formed of a hollow hemi-spherically shaped body member of a size and configuration substantially identical to the size and configuration of said top member, said body member including an interior surface, an exterior surface, and a peripheral surrounding top edge surface;

a hemi-spherically shaped compartment defined interiorally of said bottom member interior wall and opening out of a base defined between said top peripheral edges;

a multitude of circular spaced apart perforations identical in size to the perforations in said top member and disposed in said bottom member body member placing said bottom member compartment in communication with the surrounding atmosphere;

an annular flange formed contiguous with said top member bottom edge and disposed radially inwardly therefrom and extending tangentially downwardly relative thereto, the flange having an inner surface in communication with said top member compartment, a bottom rim forming end surface, and an outer facing circumferal surface disposed radially inwardly from said body member bottom edge;

the radial inward spacing of said flange member relative to said top member exterior surface being equal to the wall thickness of said bottom member as defined between said bottom member interior and exterior surfaces;

screw threads disposed about said outer circumferal surface of said flange member extending completely between said top member bottom edge surface and said flange end rim surface;

screw threads disposed adjacent said bottom member top edge surface extending circumferally about said interior surface of said bottom member body member, said screw threads being of a size and pitch complementary to said screw threads formed on said top member flange member for threadedly receiving said bottom member attached to said top member in a manner providing for ease of assembly and disassembly of said bottom member to said top member;

an elongated cylindrically shaped base member having a top end and a bottom end, the bottom end formed integrally with said interior surface of said bottom member body member with the top end projecting radially outwardly therefrom into said bottom member compartment, the axis of the base member extending normal to a plane defined by said top edges of said bottom member;

an inverted conically shaped hollow cup formed integrally with said top end of said base member and opening outwardly therefrom;

a chamber defined inwardly of said inverted conical cup and opening out of the top end thereof;

an elongated hollow cylindrical chamber formed in said base member top end extending slightly inwardly of said base member and open at its top to be in communication with said conical cup chamber;

said conical cup chamber and said base member chamber adapted to receive a scented liquid therein;

a supporting ring affixed to said exterior surface of said top member body member at the vertex thereof and projecting outwardly therefrom, the longitudinal axis of said supporting ring being diametrically aligned with the longitudinal axis of said base member, said supporting ring adapted to retain said top member body member on a tree in a suspended manner therefrom;

said bottom member body member forming a continuous co-planar junction with said top member body member when said bottom member is threadedly affixed to said flange of said top member to provide a smooth continuous exterior surface for the ornament;

said top member body member, said bottom member body member, said base member, and said conical cup are each manufactured of a high impact polystyrene plastic material; and

whereby said multitude of perforations in said top and bottom members permit the odor emanating from said scented liquid to pass from said top and bottom member compartments outwardly through said perforations and into the surrounding atmosphere.

3,945,569

FOAM DISPENSING APPARATUS

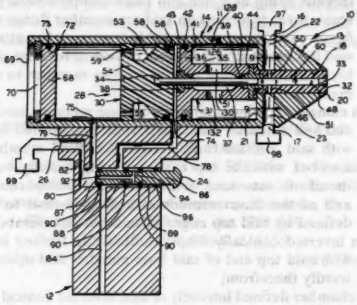
Charles R. Sperry, Wilton, Conn., assignor to Instapak Corporation, Danbury, Conn.

Filed Oct. 25, 1974, Ser. No. 517,892
Int. Cl.² B05B *15/02*
U.S. Cl. 239—112 **14 Claims**

1. In an apparatus for mixing and dispensing a plurality of liquids having a housing means, a mixing chamber in said housing means having an outlet at its forward end and a plurality of entrance ports upstream of said outlet and each entrance port for introducing fluid into said chamber, a movable valving rod for opening and closing said entrance ports, means for moving said valving rod from a forward or extended-position to rear or retracted-position away from said forward end, and a reservoir adapted to hold material for cleaning said rod when in said retracted position, the improvement comprising:

said rod having a reduced cross-sectional portion intermediate the ends thereof having a portion with a flat side, said

flat side being positioned in said reservoir when the rod is in said retracted-position and out of the reservoir and



within the mixing chamber when the rod is in the extended-position.

3,945,570

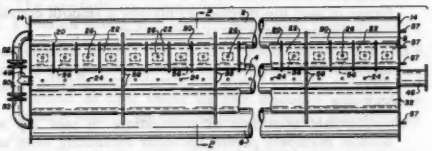
STEAM SUPPLY APPARATUS

Norman F. Dove, Cranbrook, Canada, assignor to Devron Engineering Ltd., Vancouver, Canada

Filed Dec. 10, 1974, Ser. No. 531,388

Int. Cl.² B05B *1/24*; B44D *3/42*

U.S. Cl. 239—135 **12 Claims**



1. Steam supply apparatus comprising at least a first and a second pipe located in spaced apart, side by side relationship; a cover member extending between the pipes and extending longitudinally thereof and secured thereto; a bottom wall spaced below said cover member and extending longitudinally of and between and secured to the pipes; said pipes, cover member and bottom wall forming a steam chamber therebetween; end members closing said steam chamber near opposite ends of the pipes; steam outlet means in the bottom wall and extending substantially the length of the chamber between the pipes; means for supplying steam to the pipes; each pipe having a plurality of apertures therein arranged longitudinally thereof and maintaining the interior of said steam pipe in communication with the steam chamber; said pipes being adapted to extend across a surface against which steam is to be directed through said outlet means and to support the steam chamber above said surface; stiffeners extending across the steam chamber and secured to the pipes, the cover member and the bottom wall, said stiffeners being spaced apart and dividing the chamber into sections; openings in the upper surface of the second pipe and in the cover member, above the steam chamber, at least one opening to each section, the openings being in pairs, one opening of a pair in the second pipe, one in the steam chamber; conduits joining each pair of openings; and a valve in each conduit.

3,945,571

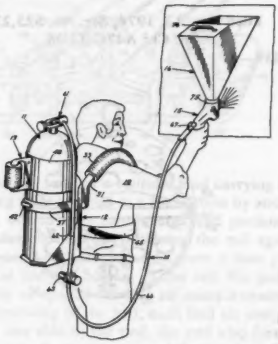
SELF-CONTAINED PORTABLE PRESSURE APPARATUS AND HAND GUN ASSEMBLY

James E. Rash, 8884 W. Warren Drive, Denver, Colo. 80227

Filed Jan. 23, 1975, Ser. No. 543,259

Int. Cl.² B05B *9/08*, *7/32*

U.S. Cl. 239—152 **11 Claims**



1. A portable, self-contained pressure apparatus readily carried around by hand to the location of operation and supported primarily by the back of a user when in operation, said apparatus comprising, in combination:

a pressurized tank,

a backpack carrier adapted to be releasably mounted on the back of a person, said carrier having a tank support frame and releasable tank fastening means on the support frame for releasably fastening the pressurized tank to the support frame, said carrier having a pair of laterally spaced, generally arcuate rigid shoulder straps attached at one end to an upper portion of said upright portion extending out away and then down therefrom to mount the tank support frame on the shoulders of the user and to dispose said support frame and tank at an angle of inclination with the tank outlet and at an elevated position in a demounted at rest position.

handle means for hand carrying the backpack carrier and tank to a point of use, said handle means including a C-clamp portion surrounding the tank positioned and centered about the midpoint between the top and bottom of the tank, releasable fastening means holding the C-clamp portion on the tank and a handle grip portion affixed to and disposed a distance away from said C-clamp portion,

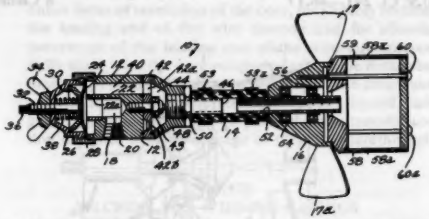
a line pressure control and coupling means coupled to said tank to regulate the amount of air pressure from said tank to a pressure responsive load device, and

a pressure driven spray gun coupled to the output of said line pressure control and coupling means, said spray gun being a pattern spray gun for spraying a fluent texture coating material on walls and the like, said spray gun having a feed hopper for storing a batch of fluent texture coating material and delivering said material to the spray gun which selectively sprays the material in response to air pressure from said line pressure control and coupling means.

3,945,572
ROTATING ATOMIZER NOZZLE

Joseph A. Bockenstette, II, P.O. Box 227, Abilene, Kans. 67410

Filed Feb. 10, 1975, Ser. No. 548,805
Int. Cl.² B05B 1/30, 3/02, 17/02
U.S. Cl. 239—171 7 Claims



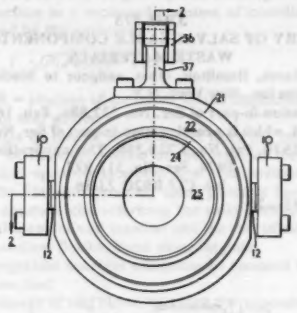
1. A spray nozzle for use on a moving vehicle comprising:
diaphragm means disposed adjacent to an inlet tube and movable between open and closed positions with respect to said inlet tube, said open position being maintained by a predetermined spray pressure within said inlet tube urging said diaphragm means away therefrom to permit the passage of spray material from said inlet tube to an adjacent downstream channel;
selectively positionable orifice means alignable with said channel for permitting spray material to be transported from said channel through a preselected orifice so that spray material passing therefrom flows at a predetermined discharge rate; and
flexible connecting means for transporting spray material passing from said orifice means to a cage assembly having fan blades, said cage assembly being rotatably supported upon a shaft which is in turn supported by said flexible connecting means so that when air of a sufficient velocity impinges upon said fan blades said cage assembly rotates about said shaft and thereby dispenses spray material outwardly therefrom.

3,945,573
FLEXIBLE DUCT ASSEMBLIES

Brian Burgess; Raymond Terence Bayliss, both of Bewdley; Peter Bryan Stokes, Halesowen, and George Thomas Eynon, Farnborough, all of England, assignors to Imperial Metal Industries (Kynoch) Limited, Birmingham, England

Continuation-in-part of Ser. No. 220,621, Jan. 25, 1972, abandoned. This application Sept. 7, 1973, Ser. No. 395,169
Claims priority, application United Kingdom, Mar. 1, 1973, 10049/73
Int. Cl.² B64C 15/08; F16L 27/06
U.S. Cl. 239—265.35 8 Claims

1. A flexible duct assembly for high temperature gases comprising axially first and second duct parts, a mounting system adjustably supporting the second duct part with respect to the first about a center located on the longitudinal axis of the duct assembly, generally axially extending portions on said duct parts, which portions interfit to provide a first pair of radially facing surfaces and a second pair of such surfaces located radially outwardly from the first, said axially extending portions including an annular axial extension on the first duct part extending into an annular channel on the second duct part, a radially inwardly facing surface of the extension providing a surface of said pair and a radially outwardly facing surface of the extension providing a surface of the second pair, the surfaces of the first pair being complementary and relatively movable, there being a primary seal between the surfaces of the first pair and an annular block of elastomeric material bonded between the surfaces of the second pair so as to present a major thickness against passage of gases between the surfaces of the second pair and so as to be deformable in shear upon adjustment of the second duct part relative to the

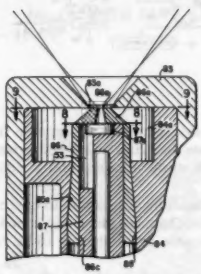


first, the block being afforded protection from the interior of the duct assembly by the primary seal.

3,945,574
DUAL ORIFICE SPRAY NOZZLE USING TWO SWIRL CHAMBERS

Frederick F. Polnauer, deceased, late of New York, N.Y., by Wilmia Marie Polnauer, executrix, 250 Riverside Drive, New York, N.Y. 10025

Division of Ser. No. 274,467, July 24, 1972, abandoned. This application Feb. 28, 1974, Ser. No. 446,949
Int. Cl.² B05B 1/34
U.S. Cl. 239—404 11 Claims



1. A nozzle for spraying fluids comprising a nozzle body, said body including first means forming a first swirl chamber having a substantially flat bottom wall and a side wall with a portion thereof in the shape of an arc of a curve, said first means including a single inlet only for receiving a first fluid to be sprayed and conveying it to said first swirl chamber, said first means producing a sprial fluid flow in said first swirl chamber, means forming a first orifice providing the outlet of said first swirl chamber for the first fluid to exit therefrom, said first orifice having a lower surface in communication with said first swirl chamber and an upper surface, and a second means forming a second swirl chamber having a substantially flat bottom wall and a side wall with a portion thereof in the shape of an arc of a curve, said second swirl chamber of said second means is formed surrounding said means forming said first orifice with the depth of the second swirl chamber being greater than the height of said first orifice, said second means including a single inlet only for receiving a second fluid and conveying it to said second swirl chamber, said second means producing a spiral fluid flow in said second swirl chamber, and means forming an outlet for the second fluid adjacent the location where the first fluid exits from adjacent said first orifice commencing at a location which is substantially copla-

nar with said upper surface of said means forming said first orifice whereby said first and second fluids are mixed.

3,945,575

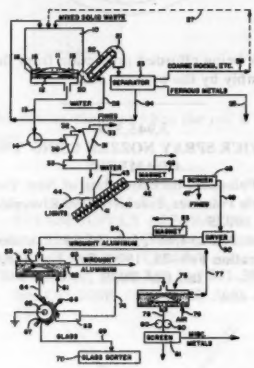
RECOVERY OF SALVAGEABLE COMPONENTS FROM WASTE MATERIALS

Paul G. Marsh, Hamilton, Ohio, assignor to Black Clawson Fibreclaim Inc., New York, N.Y.

Continuation-in-part of Ser. No. 332,886, Feb. 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 99,986, Dec. 21, 1970, Pat. No. 3,720,380. This application Oct. 7, 1974, Ser. No. 512,922

Int. Cl.² B02C *23/36*

U.S. Cl. 241—20 11 Claims



1. The method of salvaging scrap aluminum from heterogeneous municipal waste materials which comprises the steps of:

a. depositing such waste material and a liquid in treating vessel,

b. subjecting the resulting suspension to combined forces of hydraulic and mechanical shear and mechanical impact causing the frangible solids therein to be reduced to the following:

i. flake-like particles of aluminum alloy,

ii. other metal particles including pellets of aluminum foil,

iii. particles of glass and other pulverulent inorganic materials,

iv. fiber and other organic materials in particle form,

c. extracting said reduced materials of less than a preselected maximum particle size from the remainer of said suspension,

d. treating said extracted materials to separate the majority of said fiber and other organic materials from said particles of aluminum, other metal, and glass and other inorganic materials,

e. removing fines from the resulting mass of aluminum, other metal, and glass and other inorganic particles to establish a predetermined small range of sizes for the remaining mass of particles,

f. causing physical interaction of the various particles in said remaining mass of aluminum, other metal, and glass and other inorganic particles within said range of sizes by agitating said mass until said aluminum flake-like particles migrate to the top surface portion of said mass, and

g. effecting removal of the resulting concentrated aluminum flake-like particles from the top surface portion of said mass by a skimming action.

3,945,576

STOCK PULPER

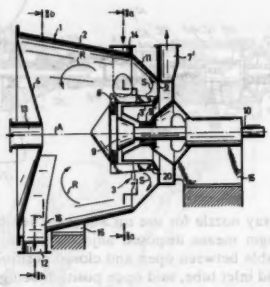
Albrecht Kahmann, Weingarten, Germany, assignor to Escher Wyss GmbH, Ravensburg, Germany

Filed Sept. 5, 1974, Ser. No. 503,251

Claims priority, application Switzerland, Sept. 11, 1973, 13013/73

Int. Cl.² B02C *23/36*

U.S. Cl. 241—46.17 8 Claims



1. A stock pulper comprising

a container for receiving a stock suspension, said container being in the form of a body of revolution about a horizontal longitudinal axis with an increasing diameter from one end towards an opposite end;

a rotor rotatably mounted within said container on said axis at said one end and having a plurality of arms for imparting a rotational and circulatory motion to a stock suspension in said container;

a discharge pipe in said container at said opposite end for discharging heavy impurities from the stock suspension during rotation of said rotor;

a screen within said container at said one end, said screen having a dimensional component disposed axially of said container to receive an inwardly directed radial flow of the stock suspension and to pass good stock therethrough; and

a discharge pipe connected to said container downstream of said screen relative to a flow of the good stock.

3,945,577

METHOD AND APPARATUS FOR HELICALLY WINDING WIRE ON A RING-SHAPED CORE

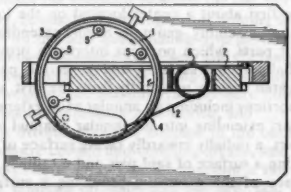
Fuminori Kaneko; Kashirou Ureshino, and Masahiro Tomita, all of Kobe, Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed June 24, 1974, Ser. No. 482,621

Claims priority, application Japan, June 23, 1973, 48-71021

Int. Cl.² B65B *81/02*

U.S. Cl. 242—4 C 13 Claims



4. An apparatus for helically winding a wire on a ring-shaped core by revolving the core circumferentially about its axis while rotating a wire drum having a reserve supply of wire thereon relatively to said core so that said wire drum will move

around a part of the revolving core while passing through the ring thereof, comprising:

a mechanism for revolving the ring-shaped core circumferentially about its axis;

a mechanism for rotating the wire drum relatively to the core so that said wire drum will move around a part of the revolving core while passing through the ring thereof; and

guide means disposed substantially continuously along the entire locus of revolution of the core, for slidably securing the leading end of the wire thereon and for allowing movement of the leading end of the wire circumferentially along with the core relative to said guide means but inhibiting rotation of said wire end around the core transversely to the circumferential direction thereof, said guide means also having at a part thereof a transfer section designed to allow passage of the wire therethrough.

3,945,578

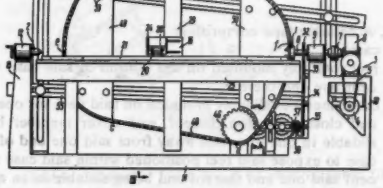
MACHINE FOR WINDING CASINGS

Igor Vasilievich Kaminsky, ulitsa Lenina, 51, kv. 12; Viktor Alexeevich Pimenov, ulitsa Donetskaya, 35, kv. 57, and Genrikh Fedorovich Severov, ulitsa pervomaiskaya, 29, kv. 4, all of Severodonetsk Luganskoi oblasti, U.S.S.R.

Continuation of Ser. No. 284,460, Aug. 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 4,954, Jan. 22, 1970, abandoned. This application July 31, 1974, Ser. No. 493,726

Int. Cl.² B65H *54/64, 54/28*

U.S. Cl. 242—7.21 **2 Claims**



1. A machine for winding resin-impregnated glass fiber filaments on a mandrel along geodesic lines for forming casings having convex end faces; said mandrel having an outer surface coinciding with the inner surface of a closed casing of rotation being wound and having convex end faces; a mechanism for uniformly rotating said mandrel about its longitudinal axis; guides extending in parallel with the axis of rotation of said mandrel; a carriage mounted in said guides adapted to reciprocate therein; transverse guides rigidly secured on said carriage and extending normal to a plane passing through the axis of rotation of said mandrel and said parallel extending guides; a slide mounted in said transverse guides adapted to reciprocate therein; a pin rigidly secured on said slide; a filament-guiding head movably secured on said carriage for reciprocation in the direction of the axis of said mandrel relative to said carriage; a feedeye for said filament-guiding head being secured rigidly on the latter and guiding the filaments onto said mandrel; a mechanism for moving said carriage in said guides and transmitting motion from the uniformly rotating mandrel to the non-uniformly reciprocating carriage; a driving sprocket for said mechanism for moving the carriage; a gear train for said mechanism adapted to move the carriage and transmit rotation from said mandrel to said driving sprocket; curved guide plates in said mechanism for moving the carriage; an endless flexible band in said mechanism adapted to move the carriage, said endless flexible band being in meshed engagement with said driving sprocket and enveloping said curved guide plates the latter of which define the curved shape of the endless flexible band and the path of its movement; one point on said endless flexible band being articulated to a pin on said slide; said curved guide plates defining the shape of a curved surface in a rectangular system of coordinated X, Y determined by the equation:

$$Y = \int \sqrt{A^2(d\psi/dX)^2 - 1}\, dX + C$$

wherein X = abscissa of the curve, or the displacement of said carriage in said guides;

ψ = angle of turn of said mandrel from the equation $\psi = f(X)$ of the dependence of the angle of turn ψ of the mandrel upon displacement X of said carriage, for winding the filaments precisely along geodesic lines;

A = a constant characterizing the ratio between the rotational speed of said mandrel and the rate of movement of said endless flexible band along its path;

C = integration constant which can be assumed to be equal to zero; and

Y = ordinate of said curve, to which corresponds the shape of curved surfaces of said curved guide plates, as a result of which, upon the movement of said point of the endless flexible band over these curved surfaces, said filament-guiding head effects the winding along geodesic lines of the curved end faces of said casings.

3,945,579

WINDING MECHANISMS WITH FRICTION DRIVE ROLLERS

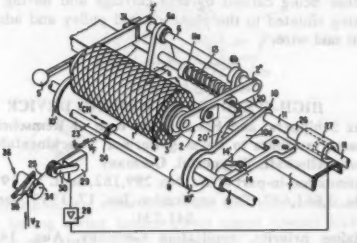
Heinz Schippers, and Erich Lenk, both of Remscheid, Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed May 31, 1974, Ser. No. 474,898

Claims priority, application Germany, June 7, 1973, 2328993

Int. Cl.² B65H *54/42, 63/02*

U.S. Cl. 242—18 DD **11 Claims**

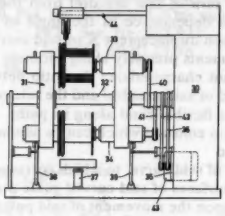


1. A winding mechanism comprising a hollow drive roller, bobbin bearing means rotatably supporting a bobbin for winding thread or the like when the bobbin or the thread wound thereon is driven in frictional contact with said drive roller, drive roller support means with said roller rotatably mounted thereon, said support means including means for shifting said roller in the axial direction of said roller and additional means allowing said drive roller to move perpendicularly to its axis of rotation, a drive shaft extending axially inside said roller, variable speed friction drive wheel means inside said roller and coupling said drive shaft and said drive roller for rotating said drive roller at stagelessly variable drive output ratios in response to axial shifting of said drive roller, said friction drive wheel means being disengageable upon movement of said roller perpendicularly to its axis of rotation, and said friction drive wheel means thereby being engageable and disengageable by movement of said drive roller perpendicularly to its axis of rotation and, when engaged, having a variable drive output ratio attained by axial shifting of said drive roller.

3,945,580
WIRE-WINDING MACHINE

Louis Veyrassat, Rolle, Switzerland, assignor to Maillefer S.A., Switzerland

Filed Oct. 22, 1974, Ser. No. 517,030
Claims priority, application Switzerland, Oct. 26, 1973, 15105/73
Int. Cl.² B65H 67/04
U.S. Cl. 242—25 A 7 Claims

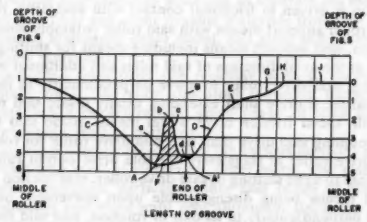


1. A winding machine for metal wire comprising: a support for at least one reel; means for driving said reel in rotation; guiding means including a traversing carriage bearing a pulley for guiding said wire as said wire is wound on said reel; and a protective device, to protect said reel in the event of wire breakage, including two protective plates of arcuate shape extending the entire length of said reel, at least one of said plates being hinged about an axis parallel to that of said reel and being movable between an open position and a closed position in which one of the edges of said one plate meets a corresponding edge of the other of said plates, the opposite edges of said two plates being spaced from one another so as to define a longitudinal slot between them, said slot being adapted to admit said wire when said protective device is in said closed position, and said protective device including a sliding protective member disposed in said slot, said sliding member being carried by said carriage and having a small opening situated in the plane of said pulley and adapted to admit said wire.

3,945,581
HIGH-SPEED CROSS-WINDING DEVICE

Heinz Schippers, and Erich Lenk, both of Remscheid, Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Continuation-in-part of Ser. No. 289,152, Sept. 14, 1972, Pat. No. 3,861,607. This application Jan. 17, 1975, Ser. No. 541,731
Claims priority, application Germany, Aug. 14, 1970, 2040479
Int. Cl.² B65H 54/28, 54/38
U.S. Cl. 242—43 R 14 Claims

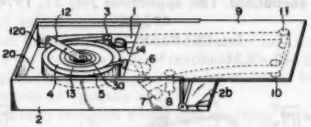


1. A high speed winding apparatus comprising a traverse device, said traverse device being a rotatably driven, cylindrical, traverse roller with spiral grooves in the cylindrical surface thereof, said spiral grooves being of opposite hand for guiding the thread in traverse strokes thereof and having stroke reversal zones at respective opposite ends of the roller, the spiral grooves having a variable depth which increases progressively from a shallowest segment at or below the surface of the roller in the longitudinal mid-portion of the roller to a point of maximum depth preceding the point of stroke reversal of the respective stroke reversal zones, and the respective spiral grooves then immediately decreasing in depth at a first rate of decrease to about the point of stroke reversal, and thereafter decreasing in depth at a rate of decrease greater than said first rate to a shallowest groove depth in the longitudinal mid-portion of the roller.

3,945,582
CASSETTE TAPE

Motoi Yagi, Zushi; Morio Akino, Fujisawa, and Hisaharu Takeuchi, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 24, 1974, Ser. No. 463,614
Claims priority, application Japan, Apr. 30, 1973, 48-48153
Int. Cl.² B65H 17/48
U.S. Cl. 242—55.19 A 7 Claims



1. A cassette tape comprising:
a case;
a reel rotatably mounted on the bottom of said case adjacent one end thereof;
a cover member slidably mounted on said case for opening and closing the top thereof, said cover member being slidable in one direction away from said one end of said case to expose said reel positioned within said case adjacent said one end thereof and being slidable in an opposite direction for closing said top of said case; and
tape delivery means mounted on the inside surface of said cover member on the end thereof in the closed position opposite said one end of said case wherein said reel is rotatably mounted for permitting the tape to be carried outside said case upon sliding movement of said cover member in said one direction.

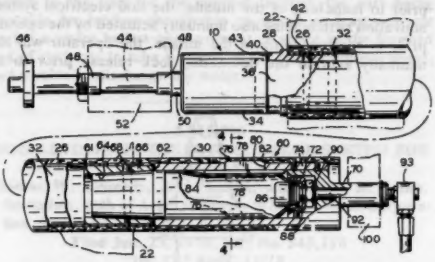
3,945,583
REWIND SHAFT

Gordon M. Ochs, Washougal, Wash., and Raymond L. Wheeler, Independence, Mo., assignors to Tidland Corporation, Camas, Wash.

Filed Oct. 10, 1974, Ser. No. 513,651
Int. Cl.² B65H 19/04, 75/24
U.S. Cl. 242—56.9 4 Claims

1. In a rewind shaft,
an elongated tube of a predetermined length having a first end and a second end,
a first journal means detachably secured to the first end of the tube,
a stop collar on the first journal means projecting radially beyond the outer periphery of the tube,
an expansible shaft segment of a length a small fraction of that of the tube, attachment means releasably securing the shaft segment to the second end of the tube, and a second journal means secured to the shaft segment at an end thereof remote from the tube, a sleeve for holding a series of fiber cores on the tube between the sleeve and

the stop collar, the expansible shaft segment serving to hold said sleeve against endwise movement relative to



said tube, whereby said fiber cores are held against endwise movement.

3,945,584

FILM CASSETTES

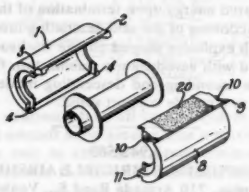
Clifford Mangan, Ilford, England, assignor to Ilford Limited, Essex, England

Filed Apr. 25, 1974, Ser. No. 464,613

Claims priority, application United Kingdom, May 16, 1973, 23347/73; May 16, 1973, 23350/73

Int. Cl.² G03B *1/04*

U.S. Cl. 242—71.1 **31 Claims**



1. A cylindrical cassette for a spool of photographic film, said cassette including a pair of lips through which the leading end of a roll of photographic film located in the cassette protrudes, said pair of lips comprising an upper extended lip and a lower co-acting lip, said pair of lips leading to an internal extended peripheral slot through which the film is to be led, the slot consisting of upper and lower channel members, each channel member having a outer portion and a inner curved portion, the inner curved portion of the upper channel member forming part of the wall of the cylindrical cassette, the extended portion of the pair of lips being set at an angle to the cylindrical body of the cassette so as to constitute a tangent to a concentric circle which has a diameter of less than 0.8 of the internal diameter of the cylindrical cassette.

3,945,585

APPARATUS FOR ON-LINE COILING OF WIRE-LIKE MATERIALS, AND RELATED METHOD

Jorn Moslener, Angermund, Germany, assignor to Demag Aktiengesellschaft, Germany

Filed Nov. 27, 1974, Ser. No. 527,744

Claims priority, application Germany, Nov. 28, 1973, 2359139

Int. Cl.² B21C *47/00*

U.S. Cl. 242—81 **10 Claims**

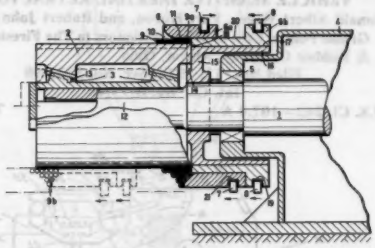
1. Apparatus for on-line coiling of wire-like material as it is discharged from a forming mill, which comprises

a. a rotatable spool positioned to receive the discharged wire-like material in generally tangential manner with a slight axial component,

b. a guide bell positioned at one end of the spool and mounted for rotation therewith,

c. said guide bell surrounding said spool in concentric relation,

d. a first surface portion of said guide bell having a radially outward flaring end portion facing toward the opposite



end of the spool and serving as a guide for a fresh end of wire-like material coming from the forming mill, and

e. a second surface portion of said guide bell surrounding said one end of the spool and being spaced radially outward thereof a distance to receive a limited number of convolutions of said wire-like material.

3,945,586

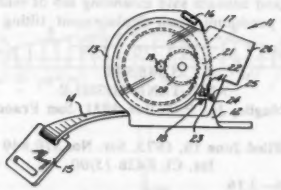
INTERPOSER RETRACTOR CONSTRUCTION

Wallace C. Higbee; Jay W. Jensen, both of Romeo, and Ronald J. Walker, Sterling Heights, all of Mich., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Feb. 4, 1974, Ser. No. 439,114

Int. Cl.² A62B *35/00*; B65H *75/48*

U.S. Cl. 242—107.4 D **4 Claims**



3. A pawl blocking combination for seat belt retractors of the type having spring loaded pawls urged toward locking against a drum driven ratchet comprising:

a drive means driven by retraction and withdrawal rotation of said drum;

a ring connected to said drive means and proportionately driven thereby, said ring including a peripheral friction surface and a cam spine segment extending radially therefrom, said cam segment ramped fore and aft to initially and terminally lift said pawl free of said ratchet;

a split legged interposer having a pawl blocking surface element, means for pivotally and extendably mounting said interposer on said retractor, said interposer legs being positioned in an interference path with said ring to engage frictionally the periphery of said ring and to straddle and frictionally engage said cam spine of said ring, said interposer pivoting on said retractor and extending by frictional engagement between said cam and legs to frictionally engage said ring and climb said ring during withdrawal rotation of said ring driven by said drive means to a position blocking said pawl by engagement of said pawl with said pawl blocking surface, and thereafter on slight rotation during retraction motion of said retrac-

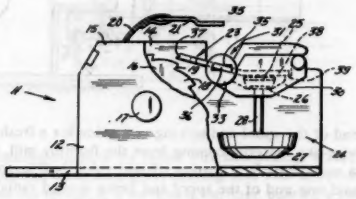
tor, said interposer, by frictional engagement between said interposer and said friction surface of said ring, reversing its pivotal extension motion to release blockage of said pawl.

3,945,587

SADDLE PAWL AND PENDULUM SUPPORT FOR VEHICLE SENSITIVE INERTIAL RETRACTORS

Ronald Albert Willey, Port Huron, and Robert John Rumpf, Grosse Pointe, both of Mich., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Nov. 12, 1974, Ser. No. 523,008
Int. Cl.² B65H 75/48
U.S. Cl. 242—107.4 A **7 Claims**



1. In a retractor with a ratchet flanged drum, the vehicle sensitive inertial locking structure comprising:
- a retractor frame defining precision located and prearranged openings;
- a separate saddle structure mounted in said frame and located in said openings;
- a pawl element pivotable in said saddle structure and having an extending tab, said pawl element having ratchet engaging teeth tiltable with said pawl into locking engagement with said ratchet; and
- a headed omnidirectional rigid pendulum supported by said saddle and beneath said extending tab of said pawl, said headed pendulum, upon displacement, tilting said pawl.

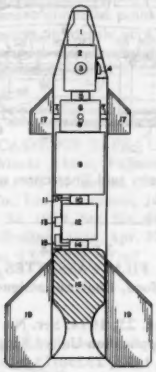
3,945,588

ANTI-TANK MISSILE

Melvin R. Maglio, Jr., P.O. Box 4031, San Francisco, Calif. 94101

Filed June 18, 1973, Ser. No. 370,840
Int. Cl. F42b 15/00
U.S. Cl. 244—3.16 **1 Claim**

1. A surface to surface guided missile incorporating a solid fuel rocket motor activated through a quick release rocket motor ignition input electrical coupler, guidance in the ascending mode being provided by vertical aerodynamic attitude control surfaces and lateral aerodynamic attitude control surfaces actuated by control rods actuated by an aerodynamic control activation system under the control of a guidance computer in accordance with input from a vertical aerodynamic attitude control adjustment and a lateral aerodynamic attitude control adjustment input being provided by a gravity switch through an electrical systems activation switch from an electrical power source, guidance in the descending mode being provided by said vertical aerodynamic attitude control surfaces and said lateral aerodynamic attitude control surfaces actuated by said control rods actuated by said aerodynamic control activation system under control of said guidance computer according to input from an infrared optical system activated by said gravity switch by input from said electrical systems activation switch under input from said electrical power source, the transfer from the ascending to the descending mode of guidance being accomplished by means of said gravity switch, input in the ascending and descending modes being provided to the aerodynamic control activation system by the electrical power source through the electrical systems activation switch, the said vertical aerodynamic attitude control adjustment and the said lateral aerodynamic attitude control adjustment being manually adjusted by the operator prior to launching of the missile, the said electrical systems activation switch being also manually actuated by the operator prior to the launching of the missile, the operator will also manually actuate the detonating lock release prior to the launching of the missile which will permit the detonating mechanism to function upon the arrival of the missile at the source of infrared energy upon termination of the descending mode said functioning of the said detonating mechanism activating the high explosive shaped charge warhead, the missile being provided with aerodynamic stabilization fins, functioning during the ascending and descending modes, which will also function as a missile support stand.

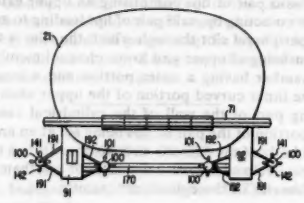


3,945,589

AMPHIBIOUS DIRIGIBLE AIRSHIPS

George Crompton, 710 Armada Road S., Venice, Fla. 33595

Filed Aug. 21, 1974, Ser. No. 499,424
Int. Cl.² B64B 1/02
U.S. Cl. 244—30 **16 Claims**



1. A semi-rigid dirigible airship comprising an envelope for containing lifting gas (lighter-than-air), said envelope having a bow which is curved in vertical section for reduction of drag, having a metal bow plate on the bow, the stern of the airship being curved in vertical section for strength but on a shorter radius than that of the bow, a metal stern plate on said stern, an elevator pivotally connected to said stern metal plate, the axis of pivotal connection being substantially horizontal, a plurality of metal ribs attached to the bow plate and connected to the stern plate and extending fore and aft both on the top and on the bottom of the airship and secured to the envelope all along their lengths on top and bottom, said airship having a vertical rudder for steering starboard and port, propulsion means for said airship, at least one ballonet in said envelope to take in and exhaust air to keep the pressure up

and not too great, a pair of separate cars one on either side of the airship underneath, cords inside said envelope extending from and attached to the upper part of the airship and attached to the cars for the support thereof, the cars being floatable for landing the airship on water, at least one car having a water ballast compartment, a scoop at the forward end of such car to take in water to the ballast compartment, and a valve to discharge the water.

3,945,590

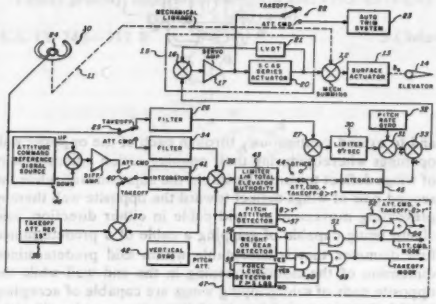
SEMI-AUTOMATIC TAKEOFF CONTROL SYSTEM FOR AIRCRAFT

Thomas W. Kennedy, Jr., Phoenix, and Harry D. Smith, Scottsdale, both of Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 23, 1975, Ser. No. 543,210

Int. Cl.² B64C *13/18*

U.S. Cl. 244—77 A **8 Claims**



1. A semi-automatic take off control system for aircraft for rotating said aircraft at no greater than a maximum predetermined pitch rate to capture a predetermined climb pitch attitude in response to a manual rotation command, comprising

first control means including limiter means responsive to said manual rotation command for rotating said aircraft at a pitch rate no greater than said maximum predetermined pitch rate,

detector means for detecting an intermediate pitch attitude less than said predetermined climb pitch attitude,

reference source means for providing a reference signal representative of said predetermined climb pitch attitude, and

second control means responsive to said detector means and said reference source means for controlling said aircraft to capture said predetermined climb pitch attitude after said aircraft attains said intermediate pitch attitude.

3,945,591

HOT AIR BALLOONS

Donald Allan Cameron, Bristol, England, assignor to Cameron Balloons Limited, Bristol, England

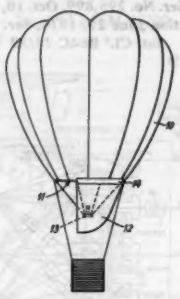
Filed Nov. 18, 1974, Ser. No. 524,896

Claims priority, application United Kingdom, Dec. 10, 1973, 57222/73

Int. Cl.² B64B *1/58*

U.S. Cl. 244—98 **4 Claims**

1. In a hot air balloon comprising a balloon envelope having an inlet aperture for hot air and a heat generating means coupled with the envelope and adapted to direct hot air into said aperture, the provision of a hood coupled with the envelope adjacent the aperture and extending part way thereround and which hood is of scoop form extending outwardly from the aperture and partially around said heat generating means, whereby the scoop form is directed windwardly, wind



and hot air is guided into the aperture to facilitate inflation of the balloon envelope.

3,945,592

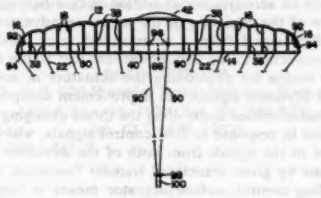
AIR REEFING SYSTEM

Stephen John Sutton, 16 Edgevalley Drive, Islington, Ontario, Canada

Continuation-in-part of Ser. No. 462,027, April 18, 1974, Pat. No. 3,893,641. This application Apr. 26, 1974, Ser. No. 464,674

Int. Cl.² B64D *17/08*

U.S. Cl. 244—152 **11 Claims**



1. An air reefing system of the type to be used in combination with a flexible flow form device, said system comprising: a first skin means of predetermined configuration; a second skin means of predetermined configuration disposed in substantially spaced apart relation from said first skin means; a plurality of third skin means disposed in interconnecting relation between said first and second skin means; at least one spor means defined by said first, second and third skin means, one end of said spor means at least partially defining a leading edge of said device, at least a portion of said spor means being closed at its opposite end to at least partially define the trailing edge of said device; a plurality of first Jordan clusters formed in said first skin means; a plurality of second Jordan clusters formed in said second skin means; a plurality of holonomic ports formed in said third skin means; a jet port means defined by at least a portion of said one spor means being open at its aft end; a jiro port means formed in said second skin means; control means operatively connected with said second skin means; and air reefing means disposed on said device, whereby said device is self-reefing upon its exposure to predetermined fluid flow.

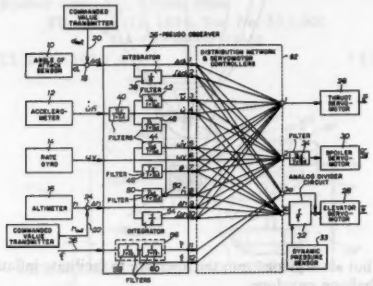
3,945,593
FLIGHT CONTROL APPARATUS

Gunther W. Schanzer, Uberlingen (Bodensee), Germany, assignor to Bodenseewerk Geratetechnik GmbH, Uberlingen (Bodensee), Germany

Continuation-in-part of Ser. Nos. 295,898, Oct. 10, 1972, abandoned, and Ser. No. 295,899, Oct. 10, 1972, abandoned. This application June 20, 1974, Ser. No. 481,310

Int. Cl.² B64C *13/50*

U.S. Cl. 244—77 D **13 Claims**



1. In an apparatus for controlling the trajectory and aerodynamic condition of flow of an airplane having thrust changing actuator means and control surface actuator means, said apparatus comprising trajectory sensor means for producing an actual trajectory signal, aerodynamic condition of flow sensor means for producing an actual aerodynamic condition of flow signal, trajectory deviation detector means having a command value input and being connected to the trajectory sensor means to produce a trajectory deviation signal indicative of the deviation of the actual trajectory signal from a commanded value, aerodynamic condition of flow deviation detector means having a command value input and being connected to the aerodynamic condition of flow sensor means to produce an aerodynamic condition of flow deviation signal indicative of the deviation of the actual aerodynamic condition of flow signal from a commanded value, and control means connected to the actuator means and to the deviation detector means for controlling the actuators in accordance with said deviation signals, the improvement comprising:

said control means controlling the thrust changing actuator means in response to first control signals, which are related to the signals from both of the deviation detector means by given associated transfer functions, and controlling control surface actuator means in response to second control signals which are related to the signals from both of the deviation detector means by given associated transfer functions.

3,945,594
CABLE TENSION RELIEVERS

David A. Burt, Didcot, England, assignor to ITW Limited, Slough, England

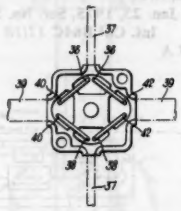
Filed Oct. 1, 1973, Ser. No. 400,588

Claims priority, application United Kingdom, Sept. 27, 1972, 44698/72

Int. Cl.² F16L *5/00*

U.S. Cl. 248—74 A **3 Claims**

1. A one-piece plastic cable clamp including a housing having a generally rectangular base and an upstanding wall around the perimeter of said base providing a pair of end walls and a pair of side walls, a slot-like opening having a predetermined dimension in each end wall in alignment with the opposite opening, a slot-like opening having a predetermined opening greater than the other mentioned openings in each side wall in alignment with the opposite opening, at least four flexible gripping wings within said housing each wing supported intermediate its length to provide a gripping free edge at opposite extremities of each wing and positioned angularly between adjacent end and side walls and the free ends of the wings converging obliquely with the next adjacent gripping wing towards the opening in its adjacent end or side wall, each of said adjacent pairs of said wings being positioned generally normal to said base with the free ends of the wings providing gripping edges initially spaced from the next adjacent wing a distance less than the thickness of a cable to be accepted therebetween and to be deflected by said cable when inserted between the free edges of said adjacent wings, the ends of each two adjacent wings being opened from one another by the action of laying the cable into the housing and pushing the cable along their gripping edges, to be gripped therebetween



and to extend continuously through each of the opposite wall openings whereby during their opening action adjacent pairs of wings deflect towards the slot in the adjacent wall while the second pair of wings deflect toward the opposite wall thereby preventing movement of said cable in either direction, said clamp being capable of gripping a cable of a predetermined first diameter that is acceptable within said predetermined dimension of the slotlike opening in the end wall while the opposite ends of said gripping wings are capable of accepting a cable having a predetermined dimension greater than the first dimension and lies in a direction transversely to the position that would be assumed by the first mentioned cable to thereby permit usage of the cable clamp with individual grips having differing diameters.

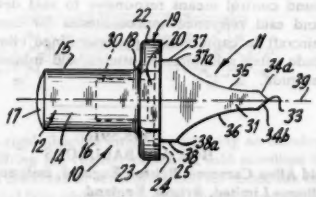
3,945,595
SHELF SUPPORT MEMBER

Ernest Schlueter, Troy, N.Y., assignor to Simmons Fastener Corporation, Albany, N.Y.

Filed Feb. 21, 1975, Ser. No. 551,758

Int. Cl.² A47G *29/02*; **F16B** *33/04*, *19/00*, *13/04*

U.S. Cl. 248—239 **4 Claims**



1. A shelf support member for insertion into a panel comprising:

a one-piece support member, said support member having as portions thereof a flange portion and a support portion projecting from said flange portion, and

a metal fastener member having an extension portion which is fastened in said support member and an insertion portion,

said insertion portion of said fastener having two flat and parallel sides and two edges, said two edges meeting in a

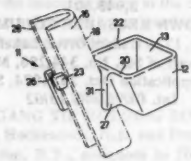
point, which point is adapted to cut the panel for insertion of said fastener, each of said edges having a curved portion starting near said point, each of which curved portions curving outwardly so that the insertion portion at said curved portions becomes wider toward said flange portion, said curved portions rolling back portions of the said panel after insertion of said point through said panel, each of said edges also having a tapered portion, each of said tapered portions being next to and in contact with said flange portion, said tapered portions tapering inwardly toward each other so that they each taper inwardly toward said flange, wherein upon insertion of said fastener through said panel portions of said panel are formed to hold said fastener at its said tapered portions.

3,945,596

SUPPORT FOR FIXING OBJECTS REMOVABLY

Franco Marraccini, Marina di Massa (Massa), Italy, assignor to Ing. C. Olivetti & Co., S.p.A., Turin, Italy

Filed Apr. 16, 1974, Ser. No. 461,277
Claims priority, application Italy, Apr. 26, 1973, 68162/73
Int. Cl.² A24F *19/00*
U.S. Cl. 248—311 R **5 Claims**



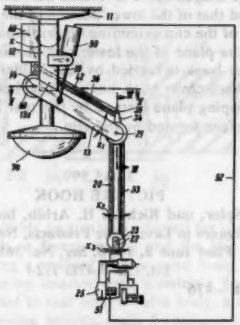
1. An ashtray, removably mountable in projecting manner to a substantially vertical structural member, said member having a substantialiy U-shaped cross-section including two arms and a circular profile connecting said arms, each of said arms being defined by an outer wall adjacent to the outer circular profile, an inner wall and an edge wall connecting the inner wall with the outer wall, said ashtray including a substantially parallelepipedal hollow body having at one side thereof a substantially circular cylindrical portion for cooperating with and complementary to said circular profile of said structural member and two extensions of said body, arranged at two sides of said cylindrical portion, for cooperating with the outer walls of said arms, one of said two extensions having an end wall inclined with respect to said one side of said hollow body ashtray, said one extension overlying partially a portion of one outer wall of an arm of said two arms, the other of said extensions being parallel with said one extension and overlying the entire depth of the outer wall of the other arm of said arms, said other extension having in an upper portion and near to the distal end thereof extending beyond the depth of said outer wall a projection opposite said cylindrical portion for cooperating with the edge wall of the other of said two arms, said projection being provided with a lug cooperative with the inner wall of said other arm adjacent said edge, said cylindrical portion and said projection bearing against said leg when in the mounted position, so that the centre of gravity of the ashtray is completely outside said structural member, said cylindrical portion, said projection and said lug defining a recess for holding said edge wall and being spaced from one to another in such manner that the ashtray may be removed by tilting it upwardly so as to disengage the lower portion of said one extension from said one arm so that the inclined end wall thereof may pass by the structural member and thereafter rotating the ashtray with respect to the structural member so as to disengage the lug of the projection from the inner wall of said other arm of the structural member and remove said edge wall from said recess.

3,945,597

MICROSURGICAL OPERATING UNIT

Friedrich Klein, Wedel, Holstein, Germany, assignor to J. D. Möller Optische Werke GmbH, Wedel, Holstein, Germany

Filed Feb. 11, 1974, Ser. No. 441,450
Claims priority, application Germany, Mar. 7, 1973, 2311257
Int. Cl.² F16M *13/00*
U.S. Cl. 248—327 **8 Claims**



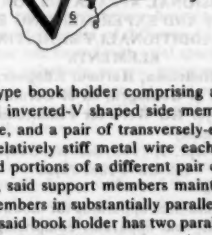
1. A microsurgical operating unit comprising a vertical support column mounted at its upper end to the ceiling of a room such as an operating theater, a sleeve rotatably supported on said vertical support column, a height-adjustment pivot arm rotatably mounted about a horizontal pivot axis disposed adjacent the lower free end of said sleeve, a vertical pendulum arm rotatably mounted at the free lower end of said pivot arm, a microscope mounted at an articulation on the free lower end of said pendulum arm, a pivot mounting for horizontal alignment of said microscope interposed between said articulation and a microscope mounting, and a parallelogram-type control linkage including a chain drive for maintining said microscope in a given vertical orientation for any rotational position of said pendulum arm.

3,945,598

BOOK HOLDER

Robert L. Bell, 170 Warwick Road, Melrose, Mass. 02176

Filed Aug. 26, 1974, Ser. No. 500,527
Int. Cl.² A47B *19/00*
U.S. Cl. 248—441 D **1 Claim**



1. A desk-type book holder comprising a pair of substantially identical inverted-V shaped side members of relatively stiff metal wire, and a pair of transversely-extending support members of relatively stiff metal wire each fixed at its ends with lower end portions of a different pair of the legs of said side members, said support members maintaining the planes of said side members in substantially parallel spaced relationship, whereby said book holder has two parallelly spaced front legs and a pair of parallelly spaced rear legs, one of said sup-

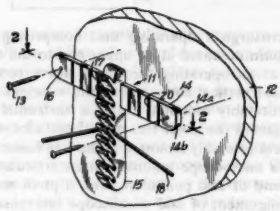
port members extending forwardly from the front legs and then upwardly to define a tray for receipt of the lower edge of a book in one use of the holder, the other of said wire support members comprising a spring clip of elongated V-shape with the free ends of the clip secured to the rear legs adjacent the ends thereof, said clip being equidistantly positioned between the rear legs and with its apex extending at least half way up the length of the rear legs, the lower portion of the clip extending upwardly and rearwardly with respect to the rear legs so that a wedge-shaped space is formed between the plane of the rear legs and that of the lower portion of the clip, the remaining portion of the clip extending upwardly and forwardly with respect to the plane of the lower clip portion whereby when a hard-cover book is carried by said holder the turned over pages and hard-cover book back will be held in position between a gripping plane formed by the rear legs and a spring gripping surface formed by the clip.

3,945,599

PICTURE HOOK

I. Martin Spier, and Richard H. Arbib, both of New York, N.Y., assignors to Level-Line Products, New York, N.Y.

Filed June 8, 1973, Ser. No. 368,396
Int. Cl.² A47G *1/24*
U.S. Cl. 248—476 **9 Claims**



1. A picture hook arrangement comprising, in combination, a first elongated member for fastening to a wall and a second elongated member, one of said first and second elongated members having at least one groove portion extending along the longitudinal axis thereof for slidably retaining said other elongated member in a direction parallel to the longitudinal axis of said first elongated member, said second elongated member having means integrally formed therewith for suspending a picture wire and the like from different locations along the length of said second elongated member, said suspension means being poisitioned along a line substantially perpendicular to said longitudinal axis, a picture being adjustable in directions along the longitudinal axes of said elongated members without tilting by slidably moving said second elongated member relative to said first elongated member and moving the location on said second elongated member from which said picture wire and the like is suspended.

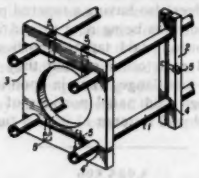
3,945,600

MULTI-DIMENSIONAL APPARATUS FOR MOUNTING LABORATORY AND EXPERIMENTING EQUIPMENT AND/OR FOR ADDITIONALLY MOUNTING OPTICAL ELEMENTS

Detlef Mallwitz, Holtensen; Hartmut Klingner, and Wolfgang Kubbetat, both of Gottingen, all of Germany, assignors to Spindler & Hoyer KG Werk fur Feinmechanik und Optik, Gottingen, Germany

Filed Apr. 9, 1973, Ser. No. 349,434
Int. Cl.² F16M *13/00*
U.S. Cl. 248—466 **11 Claims**

1. A multi-dimensional apparatus for mounting optical and other components, said apparatus comprising a plurality of rods, a plurality of connecting elements having split openings for receiving the rods and having clamping means for releasably fixedly engaging the connecting elements with the rods received by the split openings of the connecting elements, and a plurality of mounting elements also having split openings for receiving the rods and also having clamping means for releasably fixedly engaging the mounting elements with the rods



received by the split openings of the mounting elements, each of said mounting elements further having an adjustable mounting device for mounting an optical or other component on the mounting element and for adjusting the axis of that component while the mounting element is fixedly engaged with the rods.

3,945,601

KNOCK-DOWN REUSABLE COLUMN FORM

Edward C. Rowley, 1725 Hallam Drive, Lakeland, Fla. 33803

Continuation-in-part of Ser. No. 344,290, March 23, 1973, abandoned. This application Oct. 24, 1974, Ser. No. 517,784
Int. Cl.² E04G *13/02*
U.S. Cl. 249—48 **2 Claims**

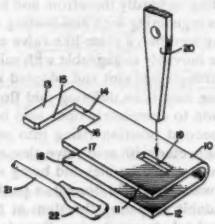
1. A knock-down reusable concrete construction form comprising plural flat panel body portions of elongated rectangular form and substantially equal dimensions, a substantially ninety degree angle bar attached to one longitudinal edge of each panel body portion with one flange of the angle bar lapping the outer face of the panel body portion and the other flange of the angle bar lapping the adjacent longitudinal edge of the panel body portion and extending inwardly of the interior face thereof, a substantially flat bar attached to the outer face of the panel body portion in parallel spaced relation to the angle bar and spaced inwardly of the other longitudinal edge of the panel body portion, said angle and flat bars being substantially coextensive lengthwise with the panel body portion, plural substantially equidistantly spaced transverse brace members mounted on said one flange of the angle bar and the outer face of the flat bar and extending across the panel body portion and having mitered ends, said brace members being of

channel cross section including opposite side longitudinal mounting flanges adjacent the open sides of the brace members and said mounting flanges lying on said one flange of the angle bar and the outer face of said flat bar, the open sides of said brace members facing said panel body portion, through bolt means common to said angle and flat bars and said brace members passing through said panel body portion, angle and flat bars and said mounting flanges and anchoring such elements firmly to said panel body portion, said brace members spaced from the panel body portion by an amount equal to the thickness of said one web of the angle bar and said flat bar, said brace members having a pair of transversely elongated slots formed therethrough and each of said slots spaced equidistantly from a respective one of each of said mitered ends and being substantially centered transversely of the brace members, and plural identical symmetrically formed generally right angular spring clips snugly embracing the corners of a rectangular cross section construction form constructed from four of said panel body portions and associated angle and flat bars and brace members, said clips having equal length arms terminating in substantially right angular inwardly projecting reversely curved terminals yieldingly interlocking with pairs of said slots in adjacent brace members at the corners of said form, the bights of said clips receiving the tips of the mitered ends of the brace members at the corners of the form and the equal length arms of the clip lying substantially flat against the exterior faces of the brace members at the corners of the form, said clip terminals substantially enclosed and protected in the interiors of the brace members.

3,945,602
GANG TIE HOLDING BOLT

Max Doubleday, Hackensack, N.J., and Douglas M. Demarest, Port Washington, N.Y., assignors to Harsco Corporation, Harrisburg, Pa.

Filed Sept. 10, 1974, Ser. No. 504,732
Int. Cl.² E04G *17/04*
U.S. Cl. 249—219 R **1 Claim**

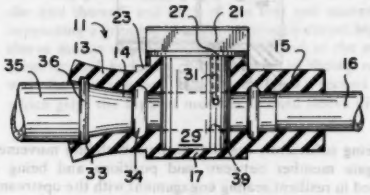


1. An elongated gang tie holding bolt for holding a tie rod having a looped end adapted to pass through abutting frames of prefabricated panel units, the frames having mating slots, comprising a body portion folded along a longitudinal axis thereof, two spaced parallel longitudinal flanges for said body portion, a finger extending from an end of one of said flanges adapted for entry through the mating slots, a cut away portion in the other of said flanges opposite said finger, parallel shoulders on said flanges adapted to engage the adjacent faces of the frames, an opening through said flanges away from said finger, the tie rod adapted to pass between said flanges and the looped end being aligned with said opening, a key adapted to pass through said opening and through the looped end for holding the tie rod in said bolt and for holding said finger in the mating slots and a slot in said one of said flanges containing said finger adapted to receive a portion of the adjacent one of the frames.

3,945,603
VALVE PARTICULARLY ADAPTED FOR USE IN VACUUM WORK

Douglas S. Fraser, New Paltz, N.Y., assignor to FTS Systems Inc., Stone Ridge, N.Y.

Filed Apr. 17, 1975, Ser. No. 568,981
Int. Cl.² F16K *5/04*, *11/00*
U.S. Cl. 251—148 **5 Claims**



1. A valve assembly particularly adapted for use in vacuum applications such as freeze drying and the like, said valve assembly including a resilient hollow valve body, a first connector means having interior walls forming a first fluid passageway connected to said hollow valve body, a second connector means having interior walls forming a second fluid passageway connected to said hollow valve body, a movable valve member disposed in rotatable fluid-tight relationship within said hollow valve body in such a manner that said valve member is movable to a first or open position to provide line-of-sight transmission of fluids from said first connector means through said valve member to said second connector means, said valve member being movable to a second or closed position wherein said flow of fluids is obstructed, said valve member having means formed therein for communication between the interior of one of said fluid passageways and the ambient surroundings when said valve member is moved to a third or release position thereby to provide for vacuum release, said connector means having grooves formed in said interior walls thereof, a plurality of said grooves being spaced on said interior wall of said first connector means, the outermost of said grooves being adapted to receive and hold vessels of varying size and the innermost of said grooves designed to prevent the deformation of the configuration of said valve body and loss of said fluid-tight seal when vessels of varying size are inserted into said connector means, a plurality of said grooves being formed on said interior walls of said second connector portion, the innermost of which being designed to prevent deformation of said valve body when connectors of varying size are inserted.

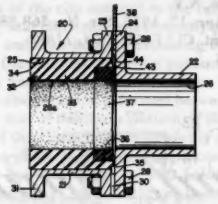
3,945,604
PACKINGLESS GATE VALVE AND ACTUATOR ASSEMBLIES

Curtis W. Clarkson, Palo Alto, Calif., assignor to The J. R. Clarkson Company, Palo Alto, Calif.

Filed Apr. 11, 1974, Ser. No. 459,949
Int. Cl.² F16K *3/02*
U.S. Cl. 251—174 **13 Claims**

4. In a gate valve, two hollow housing members having coaxial cylindrical passages of different diameter and rigidly secured together end to end with axial spacer means between them defining a relatively narrow transverse gate receiving and guiding space disposed normal to said passages, a cylindrical sleeve of greater axial length than said space substantially wholly lining the larger diameter one of said passages and having at one end an annular resilient end lip that in the valve open position extends through said space into sealing engagement with an axially facing surface of the other housing member, the internal diameter of said sleeve being substantially equal to the diameter of the passage in said other housing member, and a gate member having an imperforate portion

slidable in said space between a valve closed position wherein it blocks flow through said valve and a valve open position wherein it permits unobstructed flow through said valve, said



lip being sufficiently resilient to permit sliding movement of the gate member between said positions and being compressed in resilient sealing engagement with the upstream side of said gate member in the valve closed position.

3,945,605

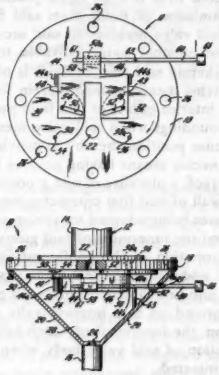
MULTIPLE PLATE VALVE

Henry Fleischer, 18 Notch Park Road, Little Falls, N.J. 07424

Continuation-in-part of Ser. No. 382,961, July 26, 1973, Pat. No. 3,880,402. This application Jan. 20, 1975, Ser. No. 542,104

Int. Cl.² F16K *3/00*

U.S. Cl. 251—212 **61 Claims**



8. A valve designed to continue to function to close off a conduit even after portions of the valve have worn, said valve comprising, in combination,

a body portion including a pair of outer cover members, each of said cover members having an aperture therein;

at least first and second closure members retained between said outer cover members, said closure members comprising first and second plates which are adapted to move between overlapping and non-overlapping positions and to cooperate with each other and close off at least one of said apertures in said outer cover members;

means associated with each of said first and second plates for defining a path of travel of said plates as said plates are urged toward or away from said apertures in said outer cover members; and

plate moving means connected to said plates for moving said plates with respect to each other and said apertures in said outer cover members, whereby said overlapping portions of said plates will be positioned in alignment with said aperture in said outer cover members to close off said aperture, and as said plates wear, said plates may be moved by said plate moving means so that unworn portions of said plates will overlap and continue to cooperate with each other to close off said aperture in said outer cover members.

3,945,606

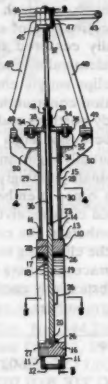
GATE VALVE

Paul D. McDonald, 624 Laurel Lane, Lakeland, Fla. 33803

Filed Apr. 23, 1975, Ser. No. 570,579

Int. Cl.² F16K *27/04*

U.S. Cl. 251—326 **10 Claims**



1. A gate valve comprising a casing including a ring member whose bore defines a flow passage through the valve, an annular flange on the ring member projecting inwardly of said bore and having a side face forming a seat, the ring member having a beveled groove in the bore thereof adjacent said seat and the ring member having a slot substantially tangential to said groove opening through the upper side thereof, a bonnet on said casing extending upwardly therefrom and having opposite side guide grooves registering with and leading upwardly from said slot of the ring member, a plate-like valve element including a beveled edge movably engageable with said seat and said beveled groove through said slot and adapted in one position to completely close said bore defining said flow passage and in a second position to completely open said bore, said valve element in said second position rising into said bonnet, an actuating stem connected with said valve element and extending through and above said bonnet and being screw-threaded on a portion thereof above said bonnet, a packing means for said stem and slidably receiving the stem at the top of said bonnet, a hand wheel means having threaded engagement with said screw-threaded portion of the stem and operable to raise and lower the stem with said valve element, and support means for the hand wheel means secured to the bonnet and extending substantially thereabove and having a swiveled connection with the hand wheel means.

3,945,607

PRESSURE SAFETY VALVE

James W. Dashner, Charlotte, N.C., assignor to Consolidated Brass Company, Matthews, N.C.

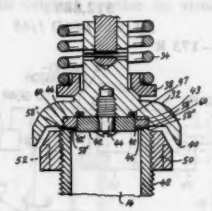
Filed Nov. 8, 1974, Ser. No. 521,975

Int. Cl.² F16K *1/34*

U.S. Cl. 251—357 **9 Claims**

1. A blow-down safety valve for use with elevated temperature fluid systems, and the like, said valve including a casing formed with an annular valve seat having two flat surfaces intersecting one another to form a projecting edge, and a valve member selectively movable to a position seated on said valve seat, said valve member including a seal retaining compart-

ment having a bottom surface and two parallel side surfaces extending generally perpendicularly from said bottom surface, and an annular plastic ring mounted in said seal retaining compartment for abutment with said bottom and side surfaces thereof with the remaining surface of said plastic ring being



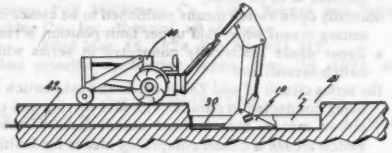
positioned to contact said valve seat projecting edge, said plastic ring being pre-stressed to a condition whereby the areas of contact between said plastic ring and said projecting edge remain substantially constant with respect to one another to predetermined elevated fluid temperatures.

3,945,608

ANCHORING MEANS FOR EARTH TUNNELING DEVICES

John G. Somerville, 2740 Old Willow Road, P.O. 611, Northbrook, Ill. 60062, and David J. Vasicek, 539 Glenwood SE., Grand Rapids, Mich. 49506

Filed Sept. 12, 1974, Ser. No. 505,483
Int. Cl.² E21B *19/00*
U.S. Cl. 254—29 R **10 Claims**



1. An anchor means for an earth working tunneling device comprising:

two back stop members, at least one of said back stop members having a circular port formed therein,

elongated spacer members attached between said back stop members and rigidly securing said members in spaced relation from each other, said spacer members and said back stop members dimensioned so that the tunneling device and one end of the associated pipe or rod driven by the tunneling device are positioned wholly within the comfines of said members; and

means secured along the inner surfaces of said spacer members for slidably mounting a tunneling device in spaced relation between said back stop members.

3,945,609

DUAL ACTION CARPET STRETCHER

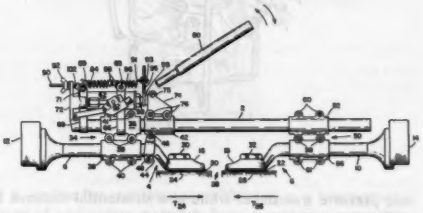
Stanley F. Platek, 187 Maplewood Ave., Maplewood, Essex County, N.J. 07040

Filed Jan. 13, 1975, Ser. No. 540,313
Int. Cl.³ A47G *27/04*
U.S. Cl. 254—60 **8 Claims**

1. Apparatus for stretching a pair of carpet segments for closing a gap between the segments, comprising:

a pair of carpet gripping members disposed so that each member grips a corresponding carpet segment:

means for coupling the carpet gripping members so that said members are displaceable toward each other and including a support member extending substantially parallel to the carpet segments, one of the pair of carpet gripping members having a first arm extending parallel to the support member near one end thereof and the other of the pair of carpet gripping members having a second arm extending parallel to the support member near the opposite end thereof, and each of the first and second arms supporting a gripping head for gripping a carpet segment, sleeve means disposed near the one end of the support member and including a first sleeve in sliding relation with the first arm near said one end and a second sleeve which grips the support member, a third sleeve disposed



near the second sleeve in sliding relation with the support member and means for coupling the third sleeve to said arm, other sleeve means disposed near the opposite end of the support member and including a fourth sleeve which grips the second arm near said opposite end and a fifth sleeve which grips the support member, means for coupling the first and second sleeves together, and means for coupling the fourth and fifth sleeves together; and

means arranged with the coupling means and operator-actuated for displacing the gripping member which grips a less taut segment of the pair of carpet segments for stretching said segment toward the other, and for displacing both gripping members when the segments gripped thereby are equally as taut for stretching said segments toward each other, with the gap between the segments being thereby closed.

3,945,610

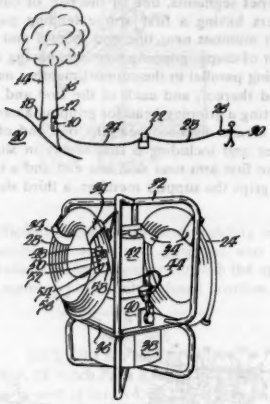
TIMBER FELLING DEVICE

James C. Solie; Daniel L. Doss, and Jerald Lee Waldrop, all of Owatonna, Minn., assignors to Owatonna Tool Company, Owatonna, Minn.

Filed Feb. 10, 1975, Ser. No. 548,181
Int. Cl.² B66F *3/24*; A01G *23/08*
U.S. Cl. 254—93 R **12 Claims**

1. A portable timber felling device for causing controlled felling of a tree comprising, a hydraulic ram unit positionable in a pre-cut recess of a tree for extension to cause the felling of the tree, a transportable hydraulic power unit separate from the ram unit for generating hydraulic power for said ram unit and including a pump and control valves, hose means extended between the power unit and the ram unit, a pressure transducer on said power unit and in circuit with the ram unit for detecting the pressure in the ram unit, a remote control unit with a manually operable control member for at least one of said control valves and a pressure gauge, and means placing

said remote control unit in communication with said one control valve and said pressure gauge in communication with



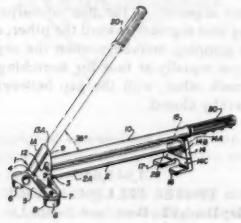
said pressure transducer while at a substantial distance from said power unit.

3,945,611

TILTING DEVICE

Rodger H. Moodie, Box 6277, Stn. J, Ottawa, Ontario, and Patrick W. Fennel, 220 Redford Ave., Westmount, Quebec, both of Canada

Filed July 15, 1975, Ser. No. 596,077
Int. Cl.² B66F 3/00
U.S. Cl. 254—131 14 Claims



1. A device for tilting heavy objects, the device comprising:

base means including a support member, a housing and an elongated base member detachably and adjustably connected at each of its ends to the support member and the housing, respectively;

the support member and the housing being adapted to engage the object to be tilted;

an elongated rigid lever member having one end thereof pivotally mounted in the housing so that the lever member is pivotable relative to the base means along a predetermined path between a first and a second position;

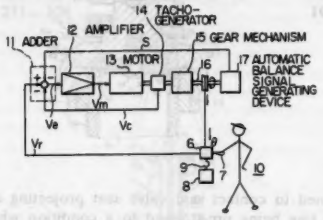
means for adjustably connecting the base member to the housing.

3,945,612

LIFTING APPARATUS

Kenro Motoda, 9-32-4, Kami-Kitazawa, Setagaya, Tokyo, Japan

Continuation-in-part of Ser. No. 460,144, April 11, 1974, abandoned, which is a continuation of Ser. No. 356,064, May 1, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 512,888
Int. Cl.² B66D 1/48
U.S. Cl. 254—173 R 2 Claims



1. In a lifting apparatus for moving a load vertically, said lifting apparatus being of the type including a driving section, a crane-type arm connected to and operable by said driving section, an operating section connected to said arm, a load carrying member attached to said operating section, said operating section including a manually movable control lever, and driving and control circuit means interconnecting said control lever and said driving section for transmitting a target speed signal proportional to movement of said control lever to said driving section to thereby move said arm and thus a load supported on said load carrying member in a direction and by an amount dependent upon corresponding said movement of said control lever; the improvement comprising:

upper limit position setting means operably connected to said lifting apparatus for determining the upper limit position to which a load supported by said load carrying member is to be lifted;

normally open switch means positioned to be closed by said setting means when said upper limit position is reached;

a Zener diode electrically connected in series with said switch means; and

the series circuit of said Zener diode and said switch means being connected in parallel with said driving and control circuit means, the resultant circuit formed when said switch means is closed comprising means for limiting the value of said target speed signal to a value to prevent further upward movement of said load, but for allowing downward movement of said load upon corresponding relative movement of said control lever.

3,945,613

VIBRATING DEVICE

Göran Jysky; Ilmar Mardla, and Björn Ericsson, all of Nykoping, Sweden, assignors to Ilmeg AB, Nykoping, Sweden

Filed Feb. 1, 1974, Ser. No. 438,934
Claims priority, application Sweden, Feb. 1, 1973, 7301393
Int. Cl.² B06B 1/18; B08B 7/02
U.S. Cl. 259—1 R 4 Claims

4. A vibrating device comprising

a. a piston member having an end wall and a cylindrical side wall,

b. a cylinder member having side walls that are concentric with respect to the side wall of said piston, and means on said cylinder member for connecting said cylinder member to the body that is to be vibrated,

c. said piston member and cylinder member being disposed substantially vertically and coaxially with respect to each other so that the piston can reciprocate vertically up and down with respect to said cylinder with only a very limited fluid flow between the exterior of said piston side wall and the interior of said cylinder,

d. inlet means in the sidewall of said piston member for introducing fluid under pressure into the interior of said piston so as to cause said piston member to move upwardly with respect to said cylinder member,

e. outlet means in the sidewall of said cylinder member for permitting the escape of pressurized fluid from both said piston and cylinder means so that the piston member can fall back to its original position by virtue of its own weight,

f. said inlets and outlets being spaced apart so that

1. the cylinder fluid inlet and the piston fluid inlet can be periodically aligned with each other,
2. the cylinder fluid outlet and the piston fluid outlet can be periodically aligned with each other, and
3. the inlets and outlets are never all aligned at the same time.

3,945,614

ICE CREAM FREEZER

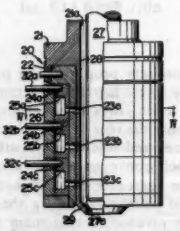
Masahiko Suzuki, Hino; Takayuki Motomura, Machida; Kiyoshi Seko, Nagoya, and Hiroshi Takahashi, Numazu, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Sapporo; Fuji Machinery Co., Ltd., Nagoya and Sanwa Machine Co., Inc., Numazu, all of, Japan

Filed Mar. 15, 1974, Ser. No. 451,511

Claims priority, application Japan, Mar. 29, 1973, 48-36033

Int. Cl.² B01F *15/02*

U.S. Cl. 259—4 R **4 Claims**



1. An ice cream dispenser comprising: a nozzle for forcing out the ice cream, said nozzle comprising a cylindrical member and a valve stem inserted into said cylindrical member so as to leave an annular passage between said member and said valve stem for the ice cream, and means for supplying a sauce onto the ice cream being forced out through said nozzle, said sauce supplying means comprising at least one annular channel formed around said member, and a plurality of transverse nozzle holes connecting the respective annular channel with said passage.

3,945,615

CONTINUOUS METHOD AND DEVICE FOR WITHDRAWING PARTICULATE MATERIAL FROM A CONTAINER

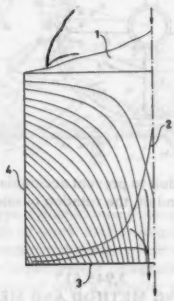
Jorma Aarne Kullervo Tuomaala, Karhula, and Bertel Myréen, Turku, both of Finland, assignors to A. Ahlstrom Osakeyhtio, Finland

Filed Oct. 15, 1973, Ser. No. 406,580

Claims priority, application Finland, Oct. 19, 1972, 2900/72

Int. Cl.² B01F *7/08*

U.S. Cl. 259—6 **9 Claims**



4. A device for continuously withdrawing a homogeneous mixture of particulate materials from a container comprising means for feeding a plurality of particulate materials into the container to form horizontal layers of the materials, said means being disposed in the upper part of the container, means for increasing the descending and the withdrawal rate of the material from the periphery towards the center of the container whereby the layers of material become slanted downwardly towards the center of the container, and slanted layers are formed which become more vertical towards the center of the container, a plurality of apertures extending radially across each of said slanted layers and outlet channels under the apertures for receiving and removing material withdrawn from each of said slanted layers through the bottom of the container, said means for increasing the descending and the withdrawal rate comprising a plurality of grooved shafts parallel to said apertures, said grooved shafts operating according to the stop-feed principle and rotating around their longitudinal axis.

3,945,616

DEVICE FOR MIXING FLOWABLE MATERIAL SUCH AS ADHESIVE WITH PARTICULATE MATERIAL

Wilhelm Lödige, Elsener Str. 9C; Fritz Lödige, Leuschner Str. 12, and Josef Lucke, Im Lohfeld 13, all of 479 Paderborn, Germany

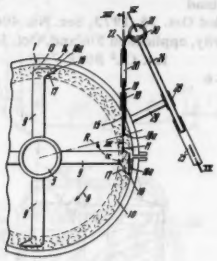
Filed Mar. 27, 1974, Ser. No. 455,290

Int. Cl.² B01F *7/04, 15/02*

U.S. Cl. 259—9 **18 Claims**

1. A device for mixing glue with particulate material comprising an elongated, horizontal cylindrical mixing chamber having an inlet at one end and an outlet at the other end, said chamber having a glue applying zone at the end adjacent said inlet, a rotating shaft extending along the central longitudinal axis of said chamber, a plurality of axially spaced, radial arms extending from said shaft to adjacent the wall of said chamber for mixing material in said chamber upon rotation of said shaft, said rotating arms moving said material circumferentially in a path adjacent the wall of said chamber, a plurality of axially spaced glue feeding conduits in said glue applying zone extending adjacent the periphery within said chamber with their ends in the path of said material and opening in the forward direction of rotation of said material, each of said

conduits being adjacent the path of one of said arms so that said arm moves the material laterally in passing the open end



of the adjacent conduit to prevent accumulation of glue on the open end of said conduit, the rotation of said arms mixing said material and glue.

3,945,617

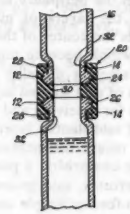
MIXING METHOD AND MEANS

Thomas R. Callery, 14 Rectory Lane, Scarsdale, N.Y. 10583

Filed Jan. 14, 1974, Ser. No. 433,080

Int. Cl.² B01F *15/00*

U.S. Cl. 259—54 **3 Claims**



1. For use in intermixing flowable content material from separate vials having a body portion, a neck portion of smaller internal diameter than the body portion to provide an access opening of lesser diameter than the interior of the vial, and a lip portion on the end of the neck portion of larger diameter than the neck portion, with an access opening extending through the lip and neck portion into the body portion, an adaptor of rigid resilient material having a passage extending continuously therethrough including a pair of axially spaced grooves shaped to correspond to the outer contour of the lip portion of the vials and having an inner wall-to-wall diameter within the range of slightly less than to up to the outer wall-to-wall diameter of the outer lip portion of the vials, expandable portions beyond the grooves at the ends of the passage having a diameter within the range of slightly less than to up to the outer wall-to-wall diameter of the neck portion of the vials and a length no greater than the length of the neck portion of the vials, while the portion between the grooves has a length dimensioned to space the grooves one from the other and a diameter corresponding to the diameter of the access opening of the vials to provide for a continuous passage of uniform dimension between the access openings of the vials when in the adaptor.

3,945,618

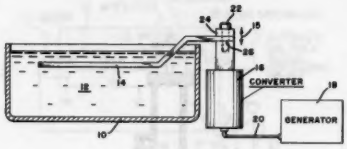
SONIC APPARATUS

Andrew Shoh, Ridgefield, Conn., assignor to Branson Ultrasonics Corporation, New Canaan, Conn.

Filed Aug. 1, 1974, Ser. No. 493,913

Int. Cl.² B01F *11/02*

U.S. Cl. 259—114 **16 Claims**



1. A sonic apparatus comprising:

a liquid;

a wave guide dimensioned to undergo flexural vibrations disposed in said liquid, and

means coupled to said wave guide for transmitting sonic energy to said wave guide for causing responsive to the propagation of flexural waves said wave guide to undergo flexural vibrations for producing vibrations in said liquid.

3,945,619

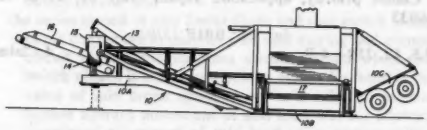
MOBILE CONTINUOUS CONCRETE PROPORTIONING PLANT

Frank P. Taibi, 829th Circle, Lewiston, N.Y. 14092

Filed Mar. 3, 1975, Ser. No. 554,515

Int. Cl.² B28C *7/04*

U.S. Cl. 259—154 **5 Claims**



1. A mobile concrete proportioning plant comprising an elongated primary frame having retractable transport wheels at one end and a towing fifth wheel at the other end, cement silo means proximate the rear of said primary frame extending transversely thereof and dischargable substantially centrally thereof, a sand belt conveyor system along one side of said primary frame, an aggregate belt conveyor system along the other side of said primary frame, a three sided telescopic aggregate hopper pivoted to said main frame adjacent the aggregate belt conveyor having means for tilting said hopper to discharge aggregate onto said conveyor, a three sided telescopic sand hopper pivoted to said main frame adjacent said sand belt conveyor having means for tilting said hopper to discharge sand onto said sand belt conveyor, collecting hopper means proximate the front of said primary frame positioned to receive cement from said silo means and sand and aggregate from their respective conveyor belts for collecting and discharge upon a concrete distributor, and means connected between said pivoted telescopic sand and aggregate hoppers for maintaining them in the fully raised rigged in condition for over the highway transport.

3,945,620

PLASTIC INJECTION MOLDING MACHINE

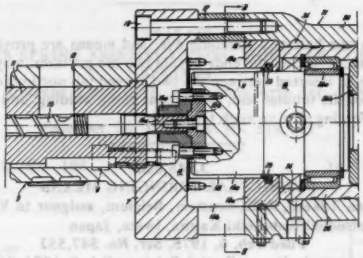
Edwin Ruegg, Netstal, Switzerland, assignor to Maschinenfabrik u.Giesserei Netstal AG, Switzerland

Filed Dec. 28, 1973, Ser. No. 429,650

Claims priority, application Switzerland, Jan. 9, 1973, 204/73

Int. Cl.² B29B 1/06

U.S. Cl. 259—191 8 Claims



1. In a plastic injection molding machine of the type including a hydraulically operated rotatable and axially displaceable plasticizer and injection screw, the improvement comprising, in combination, a supporting bridge member extending transversely of the injection axis of the machine; a cylinder of a hydraulic injection device secured to one side of said bridge member coaxially with the injection axis; a plasticizing cylinder, guiding said screw, secured to the opposite side of said bridge member coaxially with said first-named cylinder; a hollow, nonrotating injection piston guided in said first-named cylinder; a hydromotor fixedly connected with said injection piston and having a drive shaft extending coaxially through said injection piston; and means coupling said drive shaft coaxially to said screw.

3,945,621

EXTRUDER WITH HYDROSTATIC BEARING

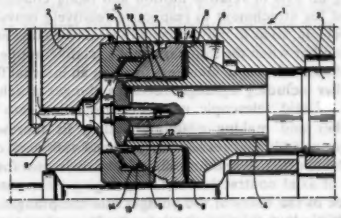
Willem Cornelis den Hertog, and Geert Rolleman, both of Hardenberg, Netherlands, assignors to Wavin B.V., Netherlands

Filed Feb. 15, 1974, Ser. No. 443,091

Claims priority, application Netherlands, Feb. 21, 1973, 7304238

Int. Cl.² B29B 1/06

U.S. Cl. 259—191 1 Claim



1. An extruder especially a multi-worm extruder comprising an extruder housing having at least one mixing worm with associated shaft and at least one hydrostatic bearing for absorbing the axial load of the conveying and mixing worm, a bearing disc on the worm shaft, a counter bearing defining a slit on one end and having a partially spherical surface on its other end, means supplying said slit with oil, said counter bearing ring being rotatably supported in a partially spherical recess in said extruder housing, and said partially spherical surface of the counter bearing resting in said partially spherical recess in said extruder housing.

3,945,622

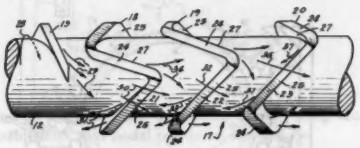
CASCADE TYPE DYNAMIC MIXER FOR EXTRUSION OF PLASTIC

Nickolas N. Sokolow, Roscoe, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Aug. 26, 1974, Ser. No. 500,333

Int. Cl.² B01F 7/08

U.S. Cl. 259—191 10 Claims



1. A cascade type dynamic mixer comprising a mixing section along a length of screw means adapted to advance thermoplastic resin material through a hollow barrel toward an outlet, having the improvement comprising:

said section provided with a plurality of encircling barrier rings in axially spaced relation therealon; and

each of said rings having a circumference which in part will closely approach an inner wall of the barrel and which circumference is in part shallower to provide substantially uniform depth narrow gap relative to the barrel inner wall, the shallower parts of the ring circumferences providing respective localized high shear cascade areas which are of progressively shallower depth in the successive rings downstream along the mixing section whereby to pass particles of progressively smaller size in the direction of plastic advance along said mixing section.

3,945,623

DEVICE FOR COOLING METAL WIRE

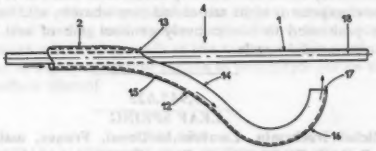
Jean-Louis Gaudilliere, L'Argentier-La-Besse, and Gilbert Dahan, Villepreux, both of France, assignors to Aluminum Pechiney, Lyon, France

Filed Feb. 19, 1975, Ser. No. 550,975

Claims priority, application France, Feb. 21, 1974, 75.05878

Int. Cl.² C21D 1/64

U.S. Cl. 266—3 R 5 Claims



1. A machine for cooling metal wire, comprising a cooling tube, an injection means for the introduction of cooling fluid into the tube and a discharge means for the cooling fluid jet leaving the tube, characterized by the fact that on the one hand the injection device includes, in advance of the cooling tube, an oblique annular slot, directed in the direction of the movement of the fluid, means for feeding cooling fluid under high pressure through the slot and into the tube and at least one cooling fluid injector in advance of the annular slot, and means for feeding cooling fluid at low pressure into said injec-

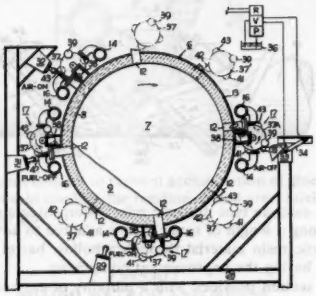
tor, and the discharge means is constituted of a curvilinear open elbow extending the cooling tube.

3,945,624

REDUCTION KILN HAVING A CONTROLLABLE DISTRIBUTION SYSTEM

Eugene F. Rossi, Wauwatosa, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 302,605, Oct. 31, 1972, abandoned.
This application Sept. 13, 1973, Ser. No. 397,081
Int. Cl.² F27B 7/20, 7/36
U.S. Cl. 266—20 1 Claim



1. A rotary ore reducing kiln comprising an elongated cylindrical chamber having a charge to be reduced contained therein; a nozzle supported by said kiln in fluid communication with said chamber, said nozzle rotating with said kiln and alternately passing beneath and above said charge; first and second fuel and air conduit means supported on the exterior of said kiln; valve means associated with said nozzle and said conduit means operable to selectively and alternately connect said first and second conduit means to said nozzle; a cam plate supported on said kiln and having at least first and second cams located in axially spaced planes operatively connected to said valve means for selective operation thereof; at least first and second trip means supported in axially spaced planes about said kiln for selective engagement by said first and second cams respectively as said kiln rotates, said cams and said trip means being arranged to operate said valve means to selectively and alternately connect said first and second conduits to said nozzle, said cams and said trip means being arranged whereby each cam must sequently engage its associated trip to index the other cam to engage its associated trip; and means connected to one of said trip means operable to selectively move said one trip means into and out of position for engagement by its associated cam whereby said valve may be positioned to continuously connect one of said conduit means to said nozzle.

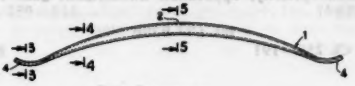
3,945,625

LEAF SPRING

Michel Duchemin, Lambres-les-Douai, France, assignor to Ressorts Du Nord S. A., Paris, France

Filed May 21, 1973, Ser. No. 362,959
Claims priority, application France, May 29, 1972, 72.19183
Int. Cl.² F16F 1/18
U.S. Cl. 267—47 3 Claims

1. A leaf spring comprising at least one curved tubular shaped leaf consisting in a hollow tube having a wall, an inner cavity, two opposite ends which are flattened in section and cross-section, said cross-section having a shape which varies substantially throughout the length of the leaf, the wall having a perimeter which is constant and a thickness which is substantially constant in each cross-section throughout the length of the leaf, wherein at least one portion of the tubular leaf adjacent one of said flattened ends is notched laterally on two opposite sides and defines two superimposed tab portions which are curved in opposite directions so as to constitute



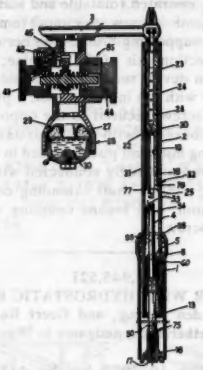
each one half of a fastening eye, and means are provided to connect together the ends of said two tab portions, a cylindrical tube inserted between the two curved tab portions at each end of the tubular leaf, said means being welding, and lateral reinforcing ribs on each tab portion.

3,945,626

VEHICULAR SPRINGING MEANS

Lucien Tilkens, Aalst-Brustem, Belgium, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Feb. 6, 1975, Ser. No. 547,552
Claims priority, application Belgium, Feb. 8, 1974, 810776
Int. Cl.² F16F 5/00
U.S. Cl. 267—64 R 19 Claims



1. A telescopic springing means for a vehicle, comprising: a first and a second telescopic member, said members each having an axis of relative motion and being coaxial, and intended for attachment to respective relatively movable parts of a vehicle, so as to move coaxially relative to one another to one another when the said parts move relative to one another, one of said telescopic members forming an internal fluid-tight chamber including a plunger recess; a plunger attached to the other of said telescopic members projecting into the said chamber and making a sliding sealing fit therewith, said plunger and plunger recess being coaxial with each other and parallel to said axis and forming a first decelerator for deceleration of axial contraction of the springing means as a consequence of the entry of the plunger into the plunger recess; a pneumatic-hydraulic accumulator having a closed pneumatic section adapted to be filled with a gas under pressure, a hydraulic section filled with liquid, and a movable wall separating the sections so as to equalize their pressures; a conduit connecting the hydraulic section to the chamber; and a second decelerator for deceleration of axial extension of the springing means, said second decelerator comprising a valve seat member attached to said one of the telescopic members, and a valving member attached to the plunger inside the chamber, said valve seat member forming a seat and a decelerator recess

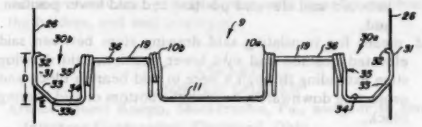
opening into said chamber, and said valving member being adapted to enter said decelerator recess at least near the end limit of the extension motion, the entry of said valving member into said recess causing expulsion of liquid therefrom, the restriction of which decelerates the extension motion, and whereby pressure in said conduit tends to extend the springing means and resist its contraction, and the decelerators tend to decelerate their respective motions at least near the limit thereof.

3,945,627

BOX SPRING ASSEMBLY USING MODULAR COIL SPRINGS

LeRoy J. Simon, Chicago, Ill., assignor to Serta, Inc., Chicago, Ill.

Filed Oct. 29, 1974, Ser. No. 518,775
Int. Cl.² F16F 3/02
U.S. Cl. 267—108 **16 Claims**



1. A resilient foundation assembly comprising:
a. frame means defining a generally planar foundation area;
b. grid means overlying and in spaced parallel relationship from said frame means over said foundation area, and
c. a plurality of spring units resiliently supporting said grid means and frame means in said spaced relationship, said spring units being disposed in generally spaced parallel relationship and extending across said foundation area, each of said spring units comprising a plurality of modular wire spring segments, each of said spring segments including a first leg section comprising
a first linear portion extending downward from a point in the plane of said grid and disposed at an angle relative to an axis normal to the plane of said frame,
a coil portion formed at the free end of said first linear portion, and
a bottom portion extending downwardly from said coil portion and disposed at an angle relative to said normal axis different in magnitude than said first linear portion angle,
the free end of said bottom portion contacting said frame, whereby varying the compressive forces between said frame means and said grid means produces rotating moments in said first linear portion and said bottom portion and a winding force in said coil portion.

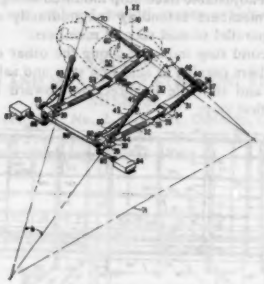
3,945,628

NODAL BEAM INERTIAL FLEXURE

Dennis R. Halwes, Arlington, Tex., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 428,235, Dec. 26, 1973, Pat. No. 3,858,831. This application June 3, 1974, Ser. No. 475,824
Int. Cl.² F16F 3/10
U.S. Cl. 267—152 **7 Claims**

1. A structure for carrying a load from a super positioned vibratory support comprising:
a. at least one nodalized beam supporting said load from nodal points on said beam and comprising two rigid arms extending toward one another from said nodal points with a multilayered flexible beam section interconnecting the confronting ends of said arms, and
b. two members extending from said support, each of said members being connected, respectively, to one of said



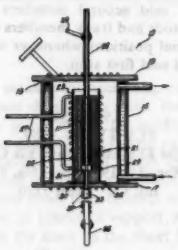
arms at a drive point, said drive points being located intermediate said nodal points on said beam.

3,945,629

REFRACTORY CARBIDE PARTICLES WITH THIN OUTER LAYER OF HIGHLY CRYSTALLINE CARBON

David V. Ragone, and Massoud T. Simnad, both of San Diego, Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Dec. 22, 1965, Ser. No. 515,741
Int. Cl.² G21C 21/00
U.S. Cl. 269—.5 **10 Claims**



1. A method of making refractory carbide particles, which method comprises heating a granule containing refractory metal and carbon to a sufficient temperature to form a molten droplet of refractory carbide, carbon being included in said droplet in excess of the stoichiometric amount which combines with the refractory metal in the highest usual valence thereof, and cooling said molten droplet below the eutectic temperature within 60 seconds or less to cause a thin continuous layer of highly crystalline carbon to precipitate out on the outer surface thereof.

3,945,630

ASSEMBLY SUPPORT FOR PRE-FABRICATING BUILDING PANELS

James C. Brunemann, R.R. 5, Box 31, Brookville, Ind. 47012

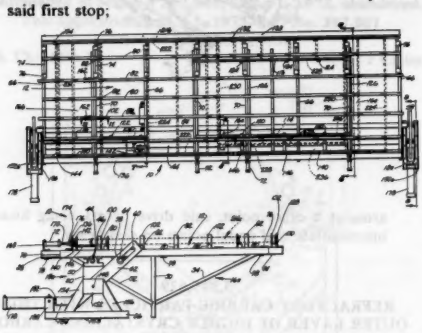
Filed May 9, 1975, Ser. No. 576,102
Int. Cl.² B23Q 3/00
U.S. Cl. 269—321 F **11 Claims**

1. An assembly support for prefabricating building panels which will assure accuracy in locating the studs of a panel relative to the longitudinal track members thereof comprising:
a. a first series of members in parallel spaced relationship extending transversely of said support;
b. a second series of members in parallel spaced relationship extending longitudinally of said support and adjustably

mounted to said first members, selected one of said second members being shiftable longitudinally of said support;

c. a first adjustable fixed stop mounted along one end of said first members extending longitudinally of said support and parallel to said second members;

d. a second stop mounted along the other end of said first members parallel to said first stop and said second members and shiftable in directions toward and away from said first stop;



e. means for shifting said second stop;

f. a plurality of stud locators adjustable and fixed to said second members; and

g. means to shift said selected ones of said second members;

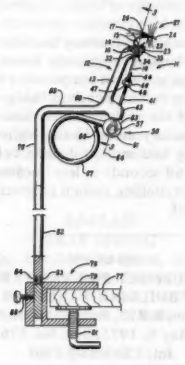
whereby studs are located between selected ones of said stud locators and are locked into position when the shiftable ones of said second members are shifted, and whereby the studs and track members are locked in their respective panel positions whenever said second stop is shifted toward said first stop.

3,945,631

FLY TYING VISE

Glen L. Sander, 9034 El Measa Court, Elk Grove, Calif. 95624

Filed Mar. 31, 1975, Ser. No. 563,338
Int. Cl.² B25B *1/20*
U.S. Cl. 269—131 **6 Claims**



1. A fly tying vise comprising:

a. a C-shaped frame including

1. an upright post,

2. an anvil mounted as a cantilever on top of said post, and

3. a bearing block mounted as a cantilever on the bottom of said post;

b. a drawing stem translatably mounted on said bearing block, the axis of said drawing stem extending toward said anvil;

c. a band mounted at its lower end on said drawing stem, the upper end of said band including a loop extending over at least a portion of said anvil, said loop being effective to clamp an interposed fish hook against said anvil in a lower position of said drawing stem and being capable of releasing the hook in an elevated position of said drawing stem,

the top surface of said anvil being slotted to receive and orient the fish hook,

said anvil including means for guiding the upper portion of said band in a predetermined path relative to the fish hook as said drawing stem is moved between said elevated position and said lower position, said guiding means including a spaced pair of grooves in said anvil parallel to said axis of said drawing stem,

said loop including a bight and a spaced pair of legs depending from said bight, said legs of said loop sliding to and fro in said grooves as said drawing stem is moved between said elevated position and said lower position; and,

d. means for translating said drawing stem between said elevated position and said lower position, said drawing stem extending through a bore in said bearing block and projecting downwardly beyond the bottom of said bearing block,

said stem translating means including a transverse axle mounted on the lower end of said stem, and a cam eccentrically journaled on said axle, said cam being movable between a first position corresponding to said elevated position of said stem and a second position corresponding to said lower position of said stem, said cam bearing against the adjacent bottom surface of said bearing block as said cam is moved from said first position toward said second position, the reactive force of said bearing block against said cam being effective to urge said stem downwardly so that said loop is biased into clamping engagement with the fish hook as said cam reaches said second position,

said axle including a pair of oppositely projecting end portions, said cam comprising a bifurcated pair of bearings journaled on said end portions of said axle, one of said bearings including a slot enabling said cam to be separated from said end portions by aligning the slot with said stem and axially moving said cam in a direction such that said stem passes through the slot until said cam disengages said axle.

3,945,632

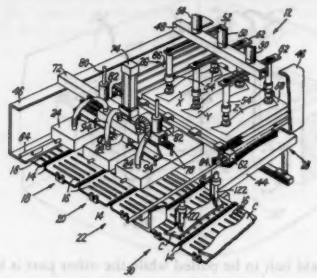
MACHINE FOR ASSEMBLING FLEXIBLE WORKPIECES

Richard W. Gray, Marblehead, Mass., assignor to USM Corporation, Boston, Mass.

Filed May 22, 1973, Ser. No. 362,835
Int. Cl.² B65H *39/00*
U.S. Cl. 270—52 **8 Claims**

1. Apparatus for assembling flexible perforate plies in predetermined relation comprising means for supporting in juxtaposition a plurality of stacks of the plies to be assembled, indexable conveyor mechanism including a plurality of pallets respectively arranged to be successively shifted into the dwell positions vacated by preceding pallets, a plurality of ply holders movable between ply receiving positions and ply delivery positions aligned with a series of the indexed pallets, a corresponding plurality of pickup devices movable for separating and removing single plies successively from their respective stacks on said supporting means, a transfer mechanism reciprocable between a position for receiving plies from the pickup devices and a position intermediate the ply holders and a series of the indexed pallets, each of the holders having a means cooperative with said transfer mechanism for predeter-

minedly positioning each ply received from said transfer mechanism and holding said ply in said predetermined position prior to deposit by the holders on said indexed pallets



respectively, and control mechanism for coordinating in cyclical movement said pickup device, said transfer mechanism, the holders, and said conveyor.

3,945,633

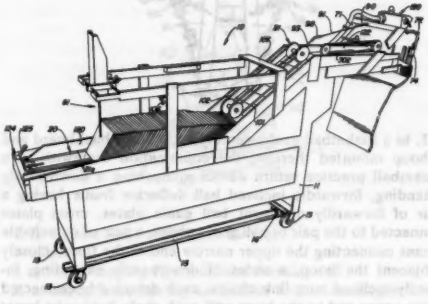
HOPPER LOADER

Arthur Albert Knopp, Stockertown, Pa., assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed July 23, 1973, Ser. No. 381,870

Int. Cl.² B65H *1/30, 3/08, 31/38*

U.S. Cl. 271—3.1 **20 Claims**



1. Apparatus for delivering a shingled stream of signatures to a hopper from which the signatures are fed, said apparatus comprising a generally horizontal first conveyor belt section for receiving an array of said-abutted signatures on edge, means for supporting said array of signatures in side-abutted on-edge condition on said first conveyor belt section, an inclined second conveyor belt section for engaging the side of the signatures and for feeding the signatures from the array in an overlapped stream toward the hopper, said inclined second conveyor belt section being inclined upwardly and away from said generally horizontal first conveyor belt section, sensor means for sensing the amount of signatures in the hopper and for actuating said first and second conveyor belt sections when the signatures in the hopper are less than a predetermined height, means for establishing a controlled amount of overlap of the signatures in said stream on said inclined second conveyor belt section comprising means for at least assisting in breaking the signatures from the on edge side-abutted condition away from the remaining signatures and for forcing said signatures against said inclined second conveyor belt section and means for adjusting the speed of said first conveyor belt section relative to said second conveyor belt section, and means for maintaining the established degree of overlap of the signatures on said inclined second conveyor belt section comprising presser means which engage the upper side of the signatures and hold the signatures against the inclined second conveyor belt section in the established overlap condition as they move up said inclined second conveyor belt section.

3,945,634

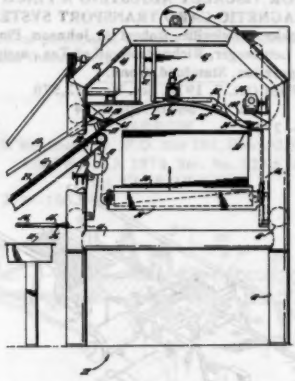
METHOD AND MEANS FOR STACKING VENEER SHEETS

Harry B. Calvert, R.R. No. 2, Hespeler, Ontario, Canada

Filed June 18, 1974, Ser. No. 480,571

Int. Cl.² B65H *29/68*

U.S. Cl. 271—183 **23 Claims**



1. In a veneer stacker for accepting moving veneer sheets and assembling said sheets on a stack, the combination comprising stationary guide means for guiding a moving veneer sheet into position over the stack, said guide means including an inverted concave surface to divert the sheet to follow a curved path adapted to support said sheet, means for stopping the sheet while said sheet is in contact with the guide means thereby to remove its source of support, and means for aligning the sheet with the stack as the sheet falls to the stack.

3,945,635

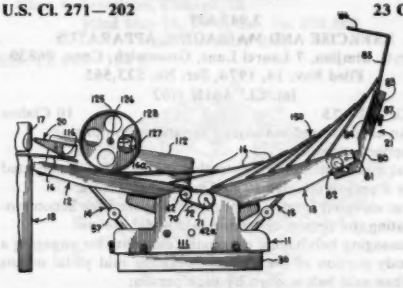
POWER STACKER

Mario J. Marin, South Norwalk, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed July 19, 1974, Ser. No. 490,197

Int. Cl.² B65H *29/66*

U.S. Cl. 271—202 **23 Claims**



1. A power stacking device for planar articles: comprising a frame;

first and second conveyor means mounted on said frame and arranged in end to end relation, the respective inner

ends of said first and second conveyor means being articulately supported by said frame, and the respective outer ends of said first and second conveyor means being adjustably supported with respect to the frame;

drive means for operating said conveyor means, said drive means including a positive drive for the upstream conveyor means and a yieldable slower drive for the downstream conveyor;

sensing means for determining when an article is delivered to one of said conveyor means; and

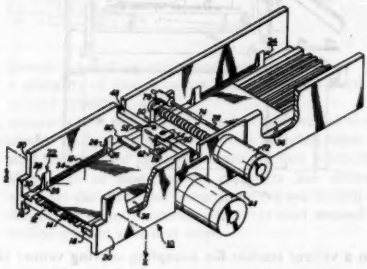
control means responsive to the operation of said sensing means to control said drive means.

3,945,636

METHOD FOR VISUALLY ADJUSTING A PINCH ROLL FOR MAGNETIC CARD TRANSPORT SYSTEM

Barry C. Kockler, Lewisville; Robert A. Johnson, Plano, and Merton C. Leinberger, Richardson, all of Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 7, 1974, Ser. No. 512,578
Int. Cl.² B65H 5/06, 9/04
U.S. Cl. 271—274 1 Claim



1. A method of aligning a pinch roll with a card guide surface of a card transport system for an electronic typewriter, said method comprising moving a card on the transport system in reverse directions between a drive roll rotating about an axis substantially perpendicular to the guide surface and a pinch roll by reversing rotation of the drive roll and pinch roll, watching the pinch roll shift axially on its axis of rotation from one side to the other when the direction of rotation is reversed, and rotating the pinch roll about a vertical axis until said axial shifting of the pinch roll substantially ceases thereby indicating the pinch roll is in alignment with the card guide surface.

3,945,637

EXERCISE AND MASSAGING APPARATUS

Luther G. Simjian, 7 Laurel Lane, Greenwich, Conn. 06830

Filed Nov. 14, 1974, Ser. No. 523,565
Int. Cl.² A61H 1/02
U.S. Cl. 272—73 10 Claims

9. An exercise and massaging apparatus comprising:

a support structure;

pedal means including a rotatable shaft for being operated by a person coupled to said support structure:

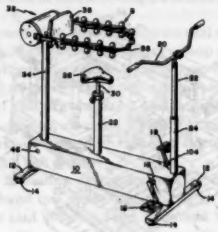
a seat elevated from said structure disposed for accommodating the person operating said pedal means;

a massaging belt having massaging elements for engaging a body portion of the person operating said pedal means when said belt is worn by such person;

rotatable means mounted for rotation about a fixed center elevated from said support structure;

means coupling the rotation of said rotatable shaft to said rotatable means, and

means coupling said belt to said rotatable means for causing responsive to the rotation of said rotatable means one



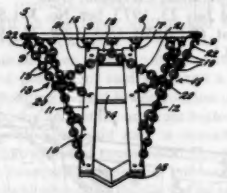
part of said belt to be pulled while the other part is being paid out.

3,945,638

BASKETBALL PRACTICE NET

Hart H. Luebkeman, c/o Trius Products Inc., Howell & Porter Sts., Cleves, Ohio 45002

Filed Feb. 14, 1975, Ser. No. 549,970
Int. Cl.² A63B 63/02
U.S. Cl. 273—1.5 A 1 Claim



1. In a basketball goal assembly including a backboard and a hoop mounted thereon, the combination therewith of a basketball practice return device comprising a downwardly extending, forwardly inclined ball deflector frame having a pair of forwardly divergent ball guide plates, cross plates connected to the pair of ball guide plates, a pair of detachable means connecting the upper narrow end of the frame closely subjacent the hoop, a series of downwardly extending, inwardly inclined wire link chains, each detachably connected at its upper end to the hoop and each chain having its lower end connected to a guide plate of the frame, cross wire link chains interconnecting the downwardly extending, inwardly inclined wire link chains, the forward chains for each guide plate forming with the wide end of the frame a ball exit opening that is disposed within the vertical boundary lines of the hoop.

3,945,639

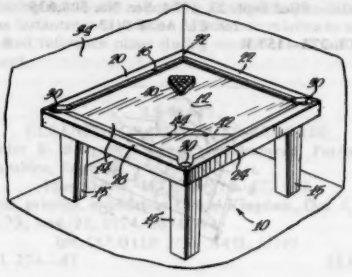
GAME TABLE

William O. Timmerman, 274 Belle Vernon Court, Rochester, Mich. 48063

Filed Mar. 17, 1975, Ser. No. 558,837
Int. Cl.² A63D 15/00
U.S. Cl. 273—3 A 14 Claims

11. In combination, a housing structure having at least two intersecting vertical walls defining a corner space; and a game table comprising a frame, means supporting said frame within said corner space and closely adjacent said walls, a horizontal playing surface supported by said frame and occupying said corner space, an upstanding rail structure enclosing said playing surface around the periphery thereof and extending above the upper surface level thereof, said rail structure having an accessible rail portion outwardly facing from said corner

space and reaching across from one said wall to the other, a plurality of spaced ball-receiving openings provided in said playing surface adjacent said accessible outwardly facing rail



portion, the opposite portion of said playing surface, located inwardly within said corner, being characterized by the absence of any such ball-receiving openings.

3,945,640

MOUNTING FOR FIGURES

James Denmark, Ilkley, England, assignor to Subbuteo Sports Games Limited, England

Filed Dec. 4, 1974, Ser. No. 529,285

Claims priority, application United Kingdom, Aug. 27, 1974, 37358/74

Int. Cl.² A63F 7/08

U.S. Cl. 273—85 R **3 Claims**

1. In a game piece of the type having
1. a figure
2. a disc having the figure affixed thereto; and
3. a dished base having an interior seat extending around the rim of the base, the disc fitting within the rim of the base with the perimeter of the disc overlying and being attached by glue to the seat of the base;

the improvement wherein

at least a part of the region in which the disc is attached to the seat has a circumferential recess in which excess glue is retained.

3,945,641

NET AND PADDLE BALL GAME APPARATUS

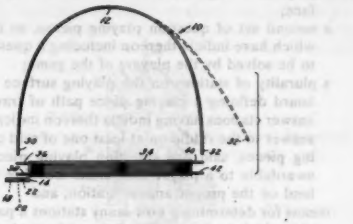
Fred L. Carbonero, 1623 Kingsmere, Rochester, Mich. 48063

Filed Dec. 12, 1974, Ser. No. 532,044

Int. Cl.² A63B 71/02

U.S. Cl. 273—95 R **5 Claims**

1. A game apparatus comprising a pair of base members, an elongated resilient rod member and an elongated net; means attaching each of said base members to opposite ends of said rod member; said rod being flexed into a U-shaped arch configuration; said net being stretched between the ends of said rod and having means at each of its ends attached to an end of said rod adjacent one of said base members to hold said rod in said arch configuration; said rod and said net defining an opening therebetween; said base members being placed on a support surface, said net and said rod being supported by said base members such that said rod is held in an inverted U position and said rod and said net are coplanar in a substantially vertical plane, said opening being positioned to allow a ball to pass therethrough.



3,945,642

ARROW

Warren D. Henthorn, Jr., P.O. Box 151, Howard, Ohio 43028

Filed Nov. 13, 1974, Ser. No. 523,532

Int. Cl.² F41B 5/02

U.S. Cl. 273—106.5 R **9 Claims**

1. An arrow assembly including a shaft having a forward end, an elongated shank having front and rear ends, the rear end of said shank being removably secured to the forward end of said shaft with said shank defining a forward lengthwise projecting extension of said shaft, the rear end portion of said shank including means defining a first outwardly projecting abutment, a shield slidably mounted on said shank for movement therealong forward of said abutment, resilient means on said shank engaged with said abutment and shield yieldingly biasing the latter forwardly along said shank, an arrowhead tip removably mounted on the forward end of said shank and including a rear portion defining a second outwardly projecting abutment establishing a limit stop of movement of said shield forwardly along said shank.

3,945,643

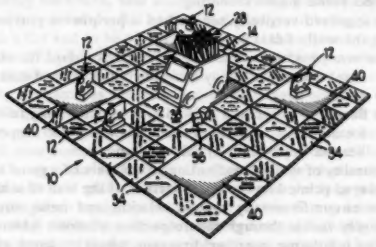
BOARD GAME APPARATUS

Jeffrey D. Breslow, Highland Park, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed May 16, 1975, Ser. No. 578,005

Int. Cl.² A63F 3/00

U.S. Cl. 273—134 B **8 Claims**



1. A board game apparatus comprising:

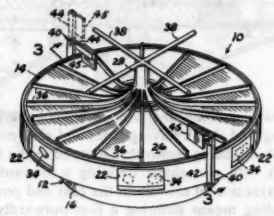
a gameboard having a playing surface thereon;
a first set of movable playing pieces, at least one for each player of the game, for movement over said playing surface;
a second set of question playing pieces, at least some of which have indicia thereon including a question or riddle to be solved by the players of the game;
a plurality of stations on the playing surface of the gameboard defining a playing piece path of travel, including answer stations having indicia thereon indicating a proper answer to the riddle on at least one of said question playing pieces, said one question playing piece thus being awardable to a player should his movable playing piece land on the proper answer station; and
means for determining how many stations a particular movable playing piece is to be moved by a player along said path of travel defined by said stations.

3,945,644

ROTATABLE DISK CHANCE DEVICE HAVING EDGE INDICATION

Nilson V. Ortiz, 1064 S. Van Ness Ave. No. 4, San Francisco, Calif. 94110

Filed Jan. 6, 1975, Ser. No. 538,998
Int. Cl.² A63F 5/04
U.S. Cl. 273—143 D **1 Claim**



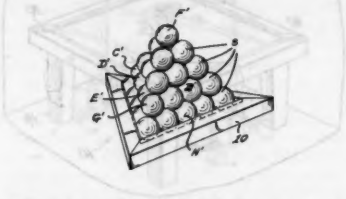
1. A game toy, comprising:
an upwardly open cylindrical base having a plurality of circumferentially spaced windows in its wall;
an upstanding axle coaxially supported by said base;
a downwardly open cylindrical top telescopically received by said base,
said top having a central upstanding spindle having a socket therein surrounding said axle for angular rotation of said top relative to said base;
a plurality of upstanding radial ribs on the upper limit of said top;
brake means supported by said base and operable to retard rotation of said top,
said brake means including,
a standard vertically secured to a peripheral portion of the wall of said base,
an arm pivotally connected with said standard for movement toward and away from the upper limit of said top, and,
a flexible flap secured to said arm in depending relation for indexing contact with said ribs when said arm overlies the upper limit of said top; and,
a plurality of symbols indicating parameters of a game to be played printed on the outer surface of the wall of said top in circumferentially spaced relation and being successively visible through the respective windows when said top is rotating in either direction, whereby, some of the symbols are displayed through the windows when said top is indexed to a stop.

3,945,645

TANGENTIAL SPHERES GEOMETRIC PUZZLE

Patrick A. Roberts, 4208 Jefferson St., Hyattsville, Md. 20781

Filed Sept. 23, 1974, Ser. No. 508,635
Int. Cl.² A63F 9/12
U.S. Cl. 273—157 R **8 Claims**



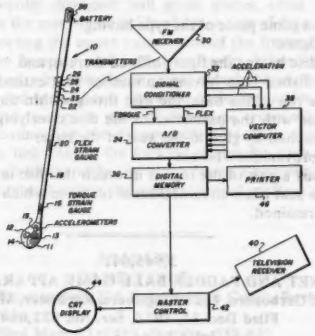
1. A geometric puzzle of tangential spheres for array in a tetrahedral pyramid comprising
a plurality of discrete and geometrically different assembly pieces for assembling said puzzle,
each said piece including at least three tangentially affixed spheres in non-linear array,
wherein further all said pieces but one of said pieces include identical triangular arrays of three spheres, and
wherein selected ones of said triangular array pieces include a further sphere tangentially affixed to one of said triangular spheres in respectively different positions out of the plane of said triangular array,
said plurality of pieces when arranged in a predetermined order defining said tetrahedral pyramid with all face portions and internal areas thereof of the size of said spheres occupied thereby.

3,945,646

ATHLETIC SWING MEASUREMENT SYSTEM AND METHOD

James L. Hammond, Holiday, Fla., assignor to Athletic Swing Measurement, Inc., Clearwater, Fla.

Filed Dec. 23, 1974, Ser. No. 535,551
Int. Cl.² A63B 69/36
U.S. Cl. 273—186 A **9 Claims**



1. A measurement system, comprising:
an athletic implement having a shaft and an end portion attached thereto, said end portion having a face which is adapted to strike a ball along a desired path of flight;
first means mounted with said end portion for sensing an element of motion relative to acceleration of said end portion in one direction substantially parallel with said desired path of flight;
second means mounted with said end portion for sensing an element of motion relative to acceleration of said end

portion in another direction substantially parallel with said face; and

means for receiving an input from said first and second sensing means and computing an output representative of the instantaneous position of said face relative to a preselected reference plane during movement of said implement.

3,945,647

CLEANING GRAMOPHONE RECORDS

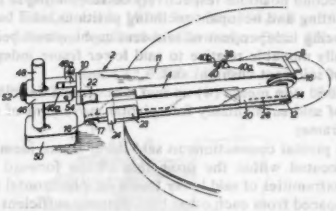
Alexander R. Rangabe, 'Stoneacre', Denmead, Portsmouth, Hampshire, England

Filed Oct. 4, 1974, Ser. No. 512,042

Claims priority, application United Kingdom, Oct. 4, 1973, 46406/73; Aug. 21, 1974, 36717/74

Int. Cl.² G11B 3/58; A47L 13/40

U.S. Cl. 274—47 15 Claims



1. In a device for cleaning a gramophone record,

support means arranged to extend generally radially of the record,

an endless belt arranged to carry an electrostatic charge, the belt having a lower run with a leading edge and a trailing edge, the belt being mounted on the support means such that the lower run of the belt extends generally radially of the record and contacts the record to collect dust and other particles from the record surface during rotation of the record,

drive means mounted on the support means to drive the belt, the drive means engaging the record in order to drive the belt from rotation of the record, and

means for removing from the belt, dust and other particles collected from the record surface.

3,945,648

FLUID TIGHT SEAL AND METHOD OF MAKING SAME

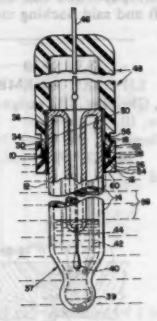
Edward A. Miller, Afton, Wyo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 2, 1974, Ser. No. 429,495

Int. Cl.² F16J 15/10; F16L 21/04

U.S. Cl. 277—102 1 Claim

1. A seal assembly, comprising a T-shaped sealing ring, a cylindrical member, an annular member and an annular gland member, said sealing ring comprising a preselected number of layers of a readily deformable plastic tape wrapped about the said cylindrical member, said annular member having a portion thereof connected to said cylindrical member a sleeve forming an open end portion of said annular member and being in spaced relationship about said cylindrical member, the said outer open end of said sleeve being in abutting contact with one end of several of the outer layers of said tape, said annular gland member being positioned in spaced apart relationship about said cylindrical member and having a portion thereof in slidable contact with an outer surface of the annular sleeve, said annular gland member having an end thereof in compressed contact with the other end of said several outer layers of said tape and forming a vertical portion of said T-shaped sealing ring, the base of said vertical portion being of a multi-wrinkle construction and in fluid tight engagement with said gland member, portions of said compressed plastic tape extending into and filling the annular space between said open end portion of the annular sleeve member



and said cylindrical member, and said annular space that is between the remaining portion of the gland and the cylindrical member to thereby form a cross bar portion of said T-shaped sealing ring.

3,945,649

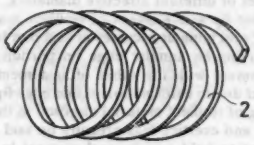
COMPLETELY FLUIDTIGHT AND FRICTIONLESS SHAFT SEAL PACKING

Gichi Nakamura, 2,4-chome, Gamocho, Joto, Osaka, Japan

Filed Mar. 18, 1974, Ser. No. 451,969

Int. Cl.² F16J 15/18

U.S. Cl. 277—123 3 Claims



1. A seal packing arrangement for a cylindrical shaft comprising a cylindrical stuffing box through which a rotating or reciprocating shaft enters a vessel containing a fluid of high pressure and/or temperature, a multiplicity of substantially thin flexible annular disc-like synthetic resin elastic matter packing members put in upright axial layers around said shaft, in a close, compressed fitting relationship, one upon the other, said disclike packing members having a defined periphery around said members with inner and outer parts, the inner periphery part of said annular packing members being substantially thinner than the outer periphery part thereof; and a gland at one end of said stuffing box to tighten said annular packing members, said stuffing box being provided with an open top end and a flat bottom end, said gland being provided with a flat end to be plugged axially into the top end region of said stuffing box to tighten said annular packing members, the inner diameter of said annular packing member being substantially the same as the diameter of said shaft, said flat end of stuffing box and said flat end of the gland being in such a juxtaposed opposite relation to each other so that said flat ends may compress said packing members substantially only axially upon each other when said packing members are tightened with said gland, whereby said annular packing members may be in an uprightly setting and closely fitting relation to said shaft while they are substantially compressed only axially to each other, thereby on one hand increasing the hydrodynamic resistance between said shaft and said packing members, and on the other hand decreasing the compression of

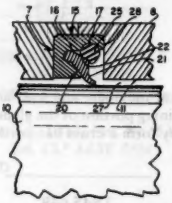
said packing members to said shaft, so as to provide practically a complete fluid tight and frictionless coupling between said shaft and said packing members at the same time, notwithstanding the pressure difference between the inside of said vessel and atmosphere and also the coefficient of friction between said shaft and said packing members.

3,945,650

LIP SEAL ASSEMBLY

Robert M. Voitik, Glenview, Ill., assignor to Innovatex Corporation, Glenview, Ill.

Filed Sept. 18, 1974, Ser. No. 507,225
Int. Cl.² F16J 15/32
U.S. Cl. 277—165 **5 Claims**



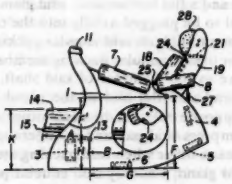
1. A lip seal assembly comprising:
a first member;
a second member;
means mounting said first and second members for relative movement in spaced relation;
one of said members having a pair of adjacent annular recesses of different effective diameters;
an annular lip seal element of resilient material seated in one of said annular recesses in said one of said members and having an annular edge lip portion extending into engagement with the other of said members in sealing manner due to deformation of said edge lip portion; and
an O-ring of resilient material disposed in the other annular recess and exerting bias pressure on said annular lip seal element to hold said lip seal element in sealed relation with said one of said members and to maintain said annular edge lip portion in sealing engagement with said other of said members.

3,945,651

CHAIR WITH INDEPENDENTLY PIVOTABLE SEAT CUSHION AND BACK FRAME

Paul Boswinkel, Churchill-laan 183¹, Amsterdam, Netherlands

Filed May 31, 1974, Ser. No. 474,871
Int. Cl.² A47C 1/02, 3/00
U.S. Cl. 297—337 **25 Claims**



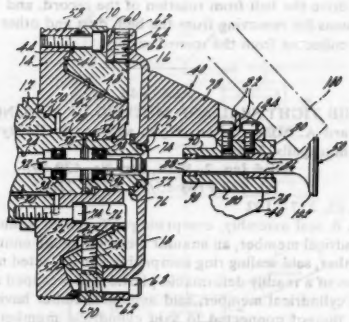
1. A chair adjustable by the occupants between seating and reclining positions responsive to forces generated by the body of an occupant, comprising:
a lower frame (1-6);
a seat cushion member (14,15) pivotally and non-lockably mounted to said lower frame and being substantially freely pivotable during occupation of the chair responsive to forces generated by an occupant of the chair;
first stop means (3) on said lower frame for defining a range of said substantially free pivotal movement of said seat cushion member;
a back frame (19-23) carrying a back cushion (18), said back frame being pivotally and non-lockably connected to said lower frame at a position on said lower frame which is spaced a substantial horizontal distance from the rearward edge of said seat cushion such that when said back frame is vertical and said seat cushion is horizontal a large gap exists therebetween, said back frame being pivotally connected at a lower portion thereof, below its center line, to said lower frame, and being substantially freely pivotable during occupation of the chair, at least between first and second positions responsive to forces generated by an occupant of the chair, said first and second positions respectively corresponding to occupant-sitting and occupant-reclining positions, said back frame being independent of said seat cushion and being pivotally movable relative to said lower frame independently of said seat cushion; and
second stop means (4) on said lower frame defining a range of said substantially free pivotal movement of said back frame;
the pivotal connections to said lower frame member being located within the projection of the forward and rear extremities of said lower frame on a horizontal and being spaced from each other by a distance sufficient to permit the cushions to assume an occupant reclining position.

3,945,652

ADJUSTABLE WORK HOLDING CHUCK

George Hohwart, Howell; Paul Toth, Allen Park, and Kenneth O. Cross, Northville, all of Mich., assignors to N. A. Woodworth Company, Detroit, Mich.

Division of Ser. No. 354,440, April 25, 1973, Pat. No. 3,873,107. This application July 8, 1974, Ser. No. 486,467
Int. Cl.² B23B 31/32, 31/34
U.S. Cl. 279—1 D **4 Claims**



1. In a chuck assembly,
an adapter at the rear of the assembly adapted for attachment to the spindle of a machine tool and to be rotatably driven thereby about an axis;
a radial diaphragm at the front of the assembly; and means interconnecting said adapter and said diaphragm for mutual rotation,
said diaphragm having a plurality of forwardly extending work holding jaws disposed concentrically around the rotational axis and said jaws being operative to grip an elongate workpiece extending along said axis and to hold a portion of said workpiece to be ground or other-

wise worked in at predetermined locations ahead of the jaws,

said interconnecting means including

a leveling member interposed between and attached to said adapter and to said diaphragm,

means for adjusting said leveling member on said adapter angularly with respect to said rotational axis about a point on said axis forwardly of said jaws and adajcent to the mentioned portion of said workpiece,

means for holding said leveling member securely in a selected angularly adjusted position,

means for adjusting said diaphragm on said leveling member radially of said rotational axis, and

means for holding said diaphragm securely in a selected radially adjusted position.

3,945,653

HOLDER FOR TOOLS AND SIMILAR OBJECTS

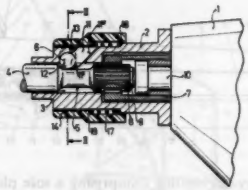
Jörg Faichle, Bempflingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 15, 1974, Ser. No. 514,918

Claims priority, application Germany, Oct. 30, 1973, 2354168

Int. Cl.² B23B *31/10*

U.S. Cl. 279—97 **9 Claims**



1. A holder for tools and similar objects having a shank provided with a transverse groove, comprising, a tube having an open end and an outer circumference, said tube being formed with an incision transversely of its longitudinal axis and said incision extending inwardly towards said axis and being inclined towards an end of said tube; a sleeve surrounding said tube with clearance, having an inner circumference and being formed with a substantially chordal slot which extends from said inner circumference towards but terminates short of an outer circumference of said sleeve; and a substantially cylindrical locking member extending through said incision normal to the axis of said tube and being freely slidable in said incision, said locking member having end portions which project beyond said outer circumference of said tube and are guided in said slot, and said locking member entering into said groove of a shank upon axial insertion of the shank through said open end of said tube.

3,945,654

CHUCK JAW AND SPINDLE ALIGNMENT ATTACHMENT

Galen B. McMullen, Culver City, Calif., assignor to Christopher Salminen and Dominick A. Whitsel, both of Los Angeles, Calif., part interest to each

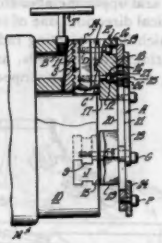
Filed Apr. 23, 1974, Ser. No. 463,356

Int. Cl.² B25B *31/12*

U.S. Cl. 279—123 **3 Claims**

1. A chuck jaw attachment for holding a set of chuck-connected soft jaws in radially tensioned position for rotationally forming an arcuate work-engaging surface thereon by operation of a coaxial spindle, said attachment comprising:

an open-centered, rigid, enclosure frame having means for removable attachment to the ends of a circle of soft jaws which are carried on radially adjustable chuck jaws generally axially aligned with said spindle, said means comprising a plurality of jaw attachment arms, each adjustably connected to said frame and individually pivotally connected thereto and swingable along an arcuate path radiused therefrom and aligned with a cylindrically projecting foot of the arm which is receivable in a corresponding socket of the outer end of a soft jaw, the frame additionally having anchorage means for securing each arm at a selected position along said arcuate path when the foot-attached soft jaws are located coaxial to said spindle.



3,945,655

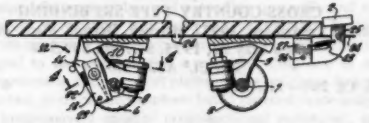
BRAKE FOR SKATEBOARD AND THE LIKE

Michael H. Banks, 317 E. LaPalma Ave., Apt. 6, Anaheim, Calif. 92801, and Gilbert R. Granillo, Jr., 1780 Matchleaf Ave., LaPuente, Calif. 91745

Filed Apr. 18, 1975, Ser. No. 569,372

Int. Cl.² A63C *17/14*

U.S. Cl. 280—11.2 **5 Claims**



1. A brake for a skateboard of the type having two sets of wheels each set of which is mounted to the board by an angle king pin assembly, said brake comprising:

a footpedal;

means for attaching said footpedal to the front of the skateboard so as to position said footpedal above the skateboard surface;

a housing having a pair of oppositely disposed openings;

a piston within each of the openings in said housing;

means for attaching said housing to the rear wheel king pin assembly of the skateboard so as to position the head of each piston adjacent to the disk of each rear wheel;

a lever having a wedge shaped surface;

means for pivotally attaching said lever to said housing so as to position said wedge shaped surface between said pistons;

cable means for attaching said lever to said footpedal.

3,945,656

SKI BINDING

William F. Rohlin, 2119 Glencoe Hills Drive, Ann Arbor, Mich. 48104

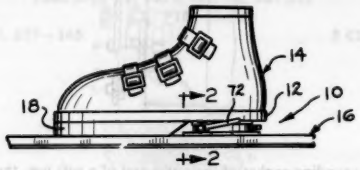
Filed May 15, 1975, Ser. No. 577,642

Int. Cl.² A63C *9/086*

U.S. Cl. 280—11.35 D **7 Claims**

1. A ski binding comprising a heel release mechanism including a base member adapted for attachment to a ski, and an upper member releasably connected to said base member and adapted for attachment to the heel of a ski boot, said base

member and said upper member having cooperating detent means including a plurality of spring actuated balls and a plurality of associated sockets for holding the members together, said detent means being releasable in response to applied forces causing relative turning of said members about a vertical axis and in response to applied forces causing relative movement of said upper member from said base member in a generally vertical direction, one of said members defining a vertical post which has projecting radially from around its periphery said spring actuated balls, and the other of said members defining an annulus telescoped over said post, said



annulus having around its inner periphery said plurality of sockets in which said balls are received for holding the annulus on the post, said annulus having grooves on its inner periphery of lesser radial depth than said sockets and angularly disposed from said sockets to an edge of said annulus through which said balls can travel when relative turning of said members occurs, said grooves being angularly disposed in both directions from each socket so as to provide a V-shaped land in an axial direction from each socket, each said land being recessed in the inner periphery of the annulus to facilitate release of said upper member from said base member in a generally vertical direction.

3,945,657

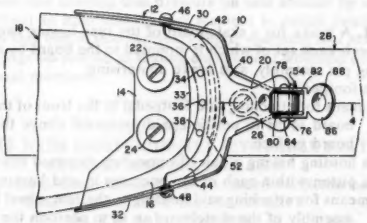
CROSS-COUNTRY TYPE SKI BINDING

Wilhelm Fredriksen, 19972 Mitchell, Detroit, Mich. 48234

Filed May 27, 1975, Ser. No. 580,964

Int. Cl.² A63C 9/00

U.S. Cl. 280—11.35 B **6 Claims**



1. A cross-country type ski binding comprising a toe iron, a clamp member and a lock member for the clamp member both pivotally mounted via longitudinally spaced apart respective pivot axes, said clamp member being in the form of a springy lever, said clamp member being pivotable from a lowered, forwardly extending clamping position in which the clamp member presses down upon the sole adjacent the toe of a ski boot for clamping the latter in said toe iron to a raised, upwardly extending release position in which the ski boot is released from said toe iron, the lock member being positioned ahead of said clamp member, said lock member being pivotally mounted at its lower end as aforesaid, a roller pivotally mounted on the upper portion of the lock member, said roller being in obstructing relationship with respect to the forward end of the clamp member whereby when said clamp member is pivoted downwardly the forward end thereof will engage the roller and cause the lock member to pivot forwardly until the forward end of the clamp member is positioned beneath the roller in its clamping position where said clamp member presses down upon the sole adjacent the toe of a ski boot, said clamp member being of a length whereby the forward end thereof extends beyond an imaginery line drawn through the pivot points of both the roller and the lock member with the lock member being pivoted to a position wherein the roller is positioned over the forward end of the clamp member in which position the clamp member exerts an upward spring pressure against the roller which tends to pivot the lock member rearwardly into secure locking relationship with the clamp member. forward

---

3,945,658

SKI BINDING

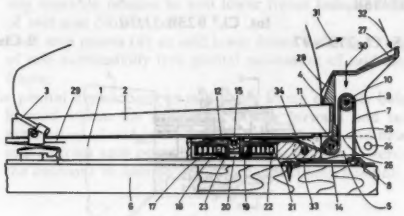
Jean-Paul Frechin, Chamonix, France, assignor to Mitchell S.A., France

Filed May 22, 1975, Ser. No. 579,935

Claims priority, application France, May 31, 1974, 74.19126

Int. Cl.² A63C 9/08

U.S. Cl. 280—11.35 K **4 Claims**



1. In a safety ski binding comprising a sole plate carrying a boot-sole gripping member at an end of the sole plate, means including a flexible connection and elastic biasing means tensioning said connection for holding said end of the sole plate against a ski, and means for biasing the boot-sole gripping member to an operative position for gripping a boot sole on said plate, the improvement wherein said means for biasing the boot-sole gripping member comprise means for operatively connecting said flexible connection to a part of said member to bias said member to its operative position under the action of said elastic biasing means.

3,945,659

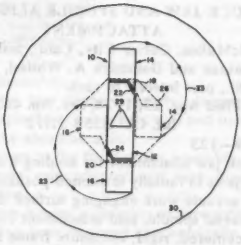
CONVERTIBLE TRAILER VEHICLE AND AMUSEMENT RIDE

Joseph Martin Brown, Wichita, Kans., assignor to Chance Manufacturing Company, Inc., Wichita, Kans.

Filed Oct. 25, 1974, Ser. No. 518,168

Int. Cl.² B62B 11/00

U.S. Cl. 280—34 R **13 Claims**



1. A convertible trailer vehicle comprising a plurality of sections, hinge means interconnecting the adjacent ends of

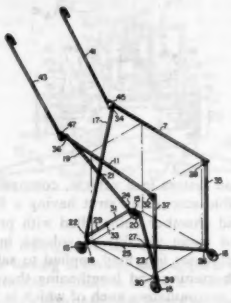
two sections at a position laterally off-set from the longitudinal center lines of said sections in positions enabling one section to be swung horizontally relative to the other between an aligned position and a side-by-side position, and releasable locking means separate from said hinge means for retaining said sections in their aligned positions, one of said sections constituting a front section and another of said sections constituting a rear section when said sections are in their aligned positions, trailer wheel means carried only by said rear section, and towing means for releasable connection to a tractor vehicle carried by said front section whereby said trailer functions substantially as a conventional semi-trailer when said sections are releasably locked in their aligned positions.

3,945,660

STRUCTURE FOR FOLDING SHOPPING CARTS, LAUNDRY CARTS AND THE LIKE

Michel Zalewski, 12 W. 72nd St., New York, N.Y. 10023

Filed May 16, 1975, Ser. No. 578,229
Int. Cl.² B62B *11/00*
U.S. Cl. 280—42 **9 Claims**



1. In a folding cart assembly having a back cross frame of centrally pivoted rigid members, a bottom cross frame of centrally pivoted rigid members, pivotal connection means attaching one of each of the bottom frame members to one of each of the back frame members at each of two corners of said cross frames to permit the members of each cross frame to pivot with respect to each other and to permit said cross frames to pivot with respect to each other, and releasable means for holding the members of at least one of the cross frames in an extended position when the assembly is unfolded, the improvement comprising:

a. a first pair of members pivotally attached at first ends thereof to the bottom cross frame near the other two corners of the bottom cross frame, respectively;

b. a second pair of members pivotally attached at first ends thereof to the back cross frame near the other two corners of the back cross frame, respectively;

c. two 270° knuckle joints, each connecting a second end of one of said first pair of members to a second end of one of said second pair of members, for holding the first pair of members in a vertical position and the second pair of members in a generally horizontal position when the assembly is unfolded and said at least one of the cross frames is held in an extended position by said releasable means; and,

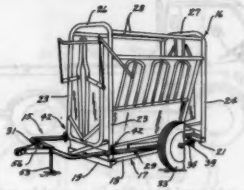
d. a generally box-shaped fabric sack open at the top thereof and fixedly attached along its opposed upper side edges to said second pair of members for holding said second pair of members in parallel relationship with predetermined spacing therebetween against forces urging them apart which are developed in the assembly when it is unfolded with said at least one of the cross frames in said extended position.

3,945,661

TRAILER APPARATUS FOR LOADING AND TRANSPORTING A FARM UNIT

Marvin J. Priefert, Rte. No. 1, Mount Pleasant, Tex. 75455

Continuation of Ser. No. 341,698, March 15, 1973, abandoned. This application Jan. 2, 1975, Ser. No. 538,237
Int. Cl.² B62B *1/08*
U.S. Cl. 280—46 **2 Claims**



1. A trailer apparatus for lifting and transporting an article of substantially rectangular parallelepiped form having a pair of outwardly directed vertically oriented apertured support plates oppositely positioned at the bottom edges of such article near one end thereof, the aperture in each such support plate constituting a substantially rectangular opening therethrough which is elongate in the horizontal direction, comprising

a substantially U-shaped trailer frame member adapted to straddle such article to be transported,

a ground wheel mounted on the outer side of each leg of said U-shaped frame member near the free end thereof for supporting said frame member above the ground, said free ends constituting the rear portions of said frame member,

a tongue member mounted on each free end of said U-shaped frame member and extending upwardly and rearwardly therefrom, each said tongue member having a cross-sectional perimeter at its forward end substantially equal to the perimeter of a corresponding one of such apertures in such support plates on the article to be transported, said tongue members being tapered rearwardly to a progressively smaller cross-sectional perimeter, each said tongue member thus substantially filling such corresponding aperture when fully inserted therein to preclude substantially all movement relative thereto except for limited pivotal movement in the vertical plane through the corresponding leg of said frame member, and

means on each leg of said frame member forward of said wheels for connecting said frame member to such article to be transported at a location on the latter remote from such support plates thereon,

whereby the full insertion of said tongue members into corresponding ones of such support plate apertures in wedging relationship therewith prevents torsional movement of said frame member which would otherwise occur as the weight of such article to be transported is borne by said frame member.

3,945,662

ENERGY ABSORBING STEERING ASSEMBLY

Genyo Murase, Nagoya; Hisahai Mineda, and Yozo Yamaguchi, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Division of Ser. No. 256,872, May 25, 1972, Pat. No. 3,822,608. This application Apr. 17, 1974, Ser. No. 461,651
Claims priority, application Japan, May 25, 1971, 46-35819; May 28, 1971, 46-37156; May 31, 1971, 46-37678
Int. Cl. B62d *1/18*
U.S. Cl. 280—87 R **10 Claims**

1. In a vehicle having a steering column assembly, including a steering shaft, steering gear means, means for flexibly coupling said shaft vertically to said gear means for forward piv-

otal movement of said shaft, and a column tube having said steering shaft journalled therein and permitting said forward pivotal movement of said shaft, apparatus for supporting said steering column assembly, comprising: a support structure releasably mounted at its front part to a portion of the instrument panel of said vehicle and secured at its rear part to said

steering column tube, said steering asssembly support structure including an impact energy absorbing member having a deformable portion to be plastically expanded outwardly and means for expanding said deformable portion of said energy absorbing member during the forward displacement of said support structure by secondary impact energy exerted thereon from said steering column.

3,945,663

OLEO/PNEUMATIC LEVELLING STRUTS

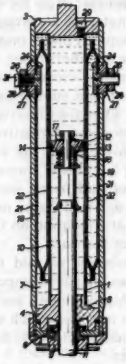
William Arthur Duckett, Ossett, England, assignor to Jonas Woodhead Limited, England

Filed July 26, 1974, Ser. No. 492,274

Claims priority, application United Kingdom, July 27, 1973, 35905/73

Int. Cl.² B60G *17/04*

U.S. Cl. 280—124 F **10 Claims**



1. A levelling strut for a vehicle, comprising:

a working cylinder;

a piston rod which is guided concentrically with said working cylinder for axial sliding movement, with one end of said piston rod projecting from said working cylinder;

a piston mounted on the other end of said piston rod for movement in said working cylinder;

flow control means for permitting but controlling fluid flow between the zones of said working cylinder on either side of said piston;

an outer cylinder which with said working cylinder defines an annular reservoir in communication with said working cylinder at least at one end of said working cylinder;

a flexible wall isolating a portion of said annular reservoir;

and means for connecting said isolated portion to a fluid line forming part of a ride height control system;

the remainder of said annular reservoir and said working cylinder being filled with gas and liquid under pressure.

3,945,664

VEHICLE HYDROPNEUMATIC SUSPENSION SYSTEM

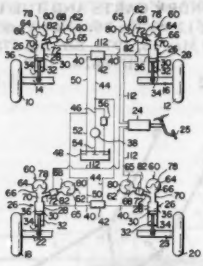
Mituo Hiruma, Kodaira, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed May 5, 1975, Ser. No. 574,257

Claims priority, application Japan, May 10, 1974, 49-52592

Int. Cl.² B60G *17/04*

U.S. Cl. 280—124 F **3 Claims**



1. A suspension system in a vehicle, comprising a retractable and extensible suspension strut having a fluid chamber therein, said fluid chamber being filled with pressurized hydraulic fluid and being variable in volume in response to increases and decreases in a load applied to said suspension strut to cause shortening and lengthening thereof, first and second pressure accumulators each of which is in interacting relationship with said fluid chamber to permit variations in the volume of said fluid chamber, and control means disposed between said fluid chamber and said second pressure accumulator, said control means normally permitting said interacting relationship between said fluid chamber and said second pressure accumulator and inhibiting said interacting relationship therebetween in response to braking of the vehicle.

3,945,665

INFLATABLE TYPE OCCUPANT RESTRAINT DEVICE FOR AUTOMOBILE OR THE LIKE

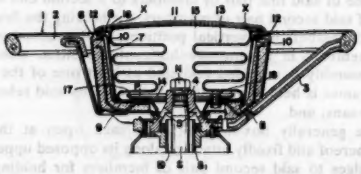
Masanobu Tsutsumi, and Kiyoshi Hanai, both of, Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 24, 1973, Ser. No. 409,083

Claims priority, application Japan, Apr. 4, 1973, 48-38590

Int. Cl.² B60R *21/10*

U.S. Cl. 280—150 AB **5 Claims**



1. An inflatable type occupant restraint device for an automobile or the like comprising:

a gas bag box secured at the central part of a steering wheel and having an opening part on a seat side,

a gas bag accommmodated in said gas bag box in a manner to be folded up,

a wheel pad firmly secured onto the outer peripheral surface of said gas bag,

said wheel pad being detachably fitted to the peripheral edge of the seat-side opening part of said gas bag box by engaging means,

the lower part of said gas bag communicating with gas injection ports joining to a gas passage, and

an inner box disposed inside the gas bag box, said inner box comprising a flange which is opened on the seat side and whose peripheral edge part extends outwardly.

3,945,666

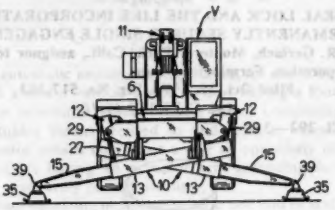
POWERED OUTRIGGER BEAMS HAVING STABILIZING SPACER PAD MEANS

Robert A. Fritsch, Cedar Rapids, Iowa, assignor to Harnischfeger Corporation, Milwaukee, Wis.

Filed Mar. 17, 1975, Ser. No. 558,925

Int. Cl.² B60S *9/00*

U.S. Cl. 280—150.5 **4 Claims**



1. Extensible outrigger beam apparatus for a wheel supported vehicle having a frame, said apparatus comprising a pair of hydraulically extensible stabilizer outrigger beams for spanning laterally underneath the frame in criss-cross fashion, each beam having a pivotal connection at one end to one side of the frame, said beams extending laterally beyond the other side of said frame from which they are pivotally connected, a motor for controllably pivoting each of said beams about its pivotal connection to the frame whereby the vertical position of the beam with respect to the frame is readily adjusted, means connected between said frame and each of said beams for locking each beam in a fixed position about its pivotal connection to prevent said beams from upward pivotal movement, and spacing pad means connected between said frame and said beams and also connected between said beams providing a firm sliding fit between said beams and said frame.

3,945,667

HIGH-RIDE CONVERSION MEMBER FOR CONVENTIONAL BICYCLES

Henry A. Cipres, Los Angeles, Calif., assignor to L. A. Emergency Oxygen, Inc., Los Angeles, Calif.

Filed Mar. 5, 1975, Ser. No. 555,692

Int. Cl.² B62K *3/02*

U.S. Cl. 280—7.15 **3 Claims**

1. A bifurcated seat extension member for converting a conventional bicycle, of the type having a frame with an upper bar between an upright seat-supporting member and a housing for a steering fork bearing assembly, to a high-ride bicycle, said seat extension being comprised of a hollow cylindrical member having a contractible clamping means around its upper end and a post at its lower end, said post being adapted to fit into said upright seat-supporting member of a conventional bicycle and to be secured by a contractible clamping means normally used to secure a conventional seat, and a branch extending forwardly from the hollow cylindrical member along the upper bar of the frame of said bicycle, said branch having a housing at the end thereof for a pedal sprocket bearing assembly, and means for securing said housing structure to said upper bar, whereby the conventional sprocket bearing assembly may be transferred to the housing

at the end of the branch to complete conversion of the bicycle to a high-ride bicycle with the addition of a few links as necessary in the bicycle chain to reach around the sprocket in the new high-ride position.

3,945,668

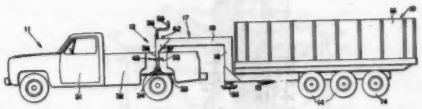
HITCH ASSEMBLY FOR GOOSE NECK TRAILER

Ronald E. Holland, Forest City, Iowa, assignor to Winnebago Industries, Inc., Forest City, Iowa

Filed Jan. 2, 1975, Ser. No. 537,906

Int. Cl.² B62D *53/06*

U.S. Cl. 280—423 R **26 Claims**



1. A hitch assembly for connecting a fifth wheel trailer having a forwardly directed tongue to a towing vehicle comprising: first downwardly projected tubular means connected to the forward end of the tongue of the trailer, an elongated second member slidably positioned in telescopic relation with the first tubular means, said second member having a portion extended downwardly from the first tubular means, means for connecting the portion of the second member to the towing vehicle, an extendable and contractible means connected to the first tubular means and the second member operable to provide relative movement between the first means and the second member to change the overall length of the first means and second member, said extendable and contractible means including means having a threaded opening secured to the second member, an elongated screw threaded through the threaded opening, bearing means mounting the screw on the first means, crank means secured to the screw usable to rotate the screw, clamp means around the second member to hold the second member in a fixed position relative to the first member, said clamp means having a first arcuate band adjacent one side of the second member and a second arcuate band adjacent the side opposite the one side of the second member, means securing the first band and second band to the first means, and means to hold the first band and second band in firm engagement with the second member.

3,945,669

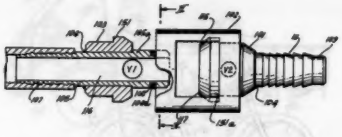
FASTENER ASSEMBLY

Michael E. Bochory, 5000 Centinela Ave., Los Angeles, Calif. 90066

Continuation-in-part of Ser. No. 366,299, June 4, 1973, Pat. No. 3,881,753. This application Mar. 20, 1975, Ser. No. 560,562

Int. Cl.² F16J 15/00

U.S. Cl. 285—92 10 Claims



1. A fastener assembly comprising a first member; a second member adapted to be connected with said first member; abutment means provided on said first and second members, respectively; and springy retaining means adapted to engage said abutment means on each of said first and second members so as to prevent their disconnection.

3,945,670

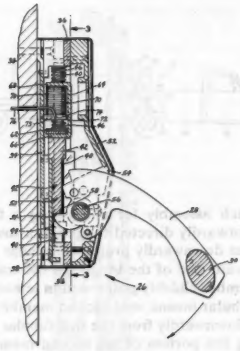
DOOR EXIT FIXTURE WITH PNEUMATIC MEANS FOR MAINTAINING A LATCH BOLT IN ITS RETRACTED POSITION

Francis C. Peterson, St. Louis County, Mo., assignor to C. Hager & Sons Hinge Manufacturing Company, St. Louis, Mo.

Filed July 29, 1974, Ser. No. 492,445

Int. Cl.² E05C 15/02

U.S. Cl. 292—92 16 Claims



1. In a door mounted in a framing structure for movement between open and closed positions and having a lock provided with a retractable latch bolt which is spring biased outwardly to an extended position where it will engage the framing structure and secure the door in its closed position, an improved exit fixture mounted on the door for retracting the latch bolt and comprising: a base mounted in a fixed position on one face of the door; a slide mounted on the base such that it is capable of moving in the vertical direction with respect to the door, the slide being coupled with the latch bolt such that when the slide is moved in one direction the latch bolt is retracted against the spring biasing force exerted thereon and when the slide is moved in the opposite direction the latch bolt is permitted to extend under the spring biasing force thereon, the coupling between the latch bolt and the slide further being such that when the slide is positioned in said opposite direction the latch bolt may be retracted by an external force without moving the slide; a spring acting on the slide and urging it in said opposite direction; a lever mounted for rotational mvoement about a horizontal pivot axis fixed with respect to the base, the lever acting upon the slide such that a manual force applied to the lever in the direction which moves the lever toward said one face of the door will cause the slide to move in said one direction against the force exerted thereon by the spring; and fluid operated force exerting means on the base for also urging the slide in said one direction, the fluid operated force exerting means when connected with and pressurized by a source of pressurized fluid being capable of expanding and overcoming the force exerted on the slide by the spring so that the slide is moved in said one direction and held in a fixed position for so long as pressurized fluid is admitted to the force exerting means, whereby the latch bolt is retracted when the lever is manually moved or when the fluid operated means is pressurized.

3,945,671

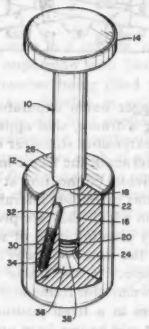
SEAL LOCK AND THE LIKE INCORPORATING PERMANENTLY SECURED SINGLE ENGAGEMENT

John R. Gerlach, Monterey Park, Calif., assignor to Emhart Corporation, Farmington, Conn.

Filed Oct. 23, 1974, Ser. No. 517,363

Int. Cl.² E05C 19/18

U.S. Cl. 292—323 4 Claims



1. In a seal lock and the like of the type having an end portion of a bolt received engaged axially into a bolt opening of a body for permanent securement therein by a resiliently urged securement member mounted within said body constantly urged from an effective non-interference position into an interference position projecting partially generally transversely into said bolt opening and said bolt end portion; the improvement comprising: a separate selectively axially movable blocking member in said body bolt opening normally transversely aligned abutting said securement member retaining and constituting the sole means retaining said securement member in its effective non-interference position prior to said bolt end portion being axially inserted into said body bolt opening; axial insertion of said bolt end portion into said body bolt opening axially engaging said bolt end portion with and slidably axially inwardly displacing said blocking member from said securement member abutment and shifting generally transverse engagement of said securement member to said bolt end portion; surface means partially on said bolt end portion and partially on said securement member ultimately interengaging following the initial of said generally transverse engagement of said securement member with said bolt end portion and continued axial movement of said bolt end portion ultimately permitting automatic transverse movement of said securement member to its interference position positively

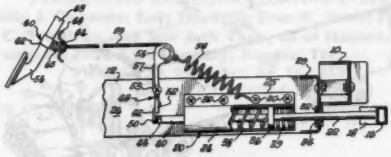
preventing subsequent withdrawal of said bolt end portion from said body bolt opening.

3,945,672

IMPACT BRAKING DEVICE

Ngew-Yee Wong, 1532 N. Boylston St., Los Angeles, Calif. 90012

Filed Jan. 6, 1975, Ser. No. 538,731
Int. Cl.² B60R 19/02
U.S. Cl. 293—5 7 Claims



1. An automatic impact braking device, for use in combination with a motor vehicle brake system, having a foot brake pedal, the automatic impact braking device comprising:

an actuator means secured to said vehicle, wherein said actuator means comprises a pair of oppositely disposed actuators having an actuator arm extending forwardly and rearwardly of said actuator;

an impact-receiving means secured to one end of said actuator means, wherein said impact-receiving means comprises an impact bumper, said bumper being extended forwardly of said vehicle;

a restraining means operably mounted to the opposite end of said actuator means, wherein said restraining means comprises: a removable restraining lug pivotally mounted to said rearward portion of said actuator bar; and a spring-biasing means attached to said lug, whereby said lug is held in a vertical restraining model;

a locking means adapted to be releasably held by said restraining means and operably mounted to said vehicle;

a pivoting means attached to said locking means whereby said locking means is allowed to pivot when disengaged from said restraining means; and a connecting means secured at one end to said locking means, the opposite end thereof being mounted to said foot-brake pedal of said vehicle.

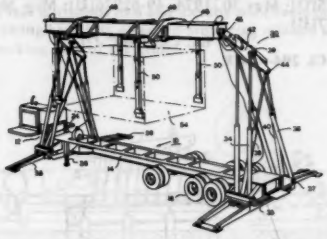
3,945,673

LOAD ENGAGING AND SUPPORTING MECHANISM

Peter J. Visser, Niles, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Division of Ser. No. 318,512, Dec. 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 267,747, June 30, 1972, Pat. No. 3,827,743. This application Feb. 25, 1974, Ser. No. 445,800
Int. Cl.² B66C 1/66
U.S. Cl. 294—67 DA 7 Claims

1. A fitting adapted for handling cargo containers with fixtures in the upper side corners with openings therein, and being mountable on laterally adjustable arms extending downwardly along opposite sides of the container: said fitting comprising a container engaging member for projecting into one of the openings in the container and being in a normally fixed position with respect to the arm, and a guide means spaced laterally from said member and including top and side plates disposed above and at the side of said member for engaging the top and end of the container for assisting in positioning said member in said one opening upon inward movement of the arm and member, and having an upwardly extending finger disposed at the free end of said member in spaced



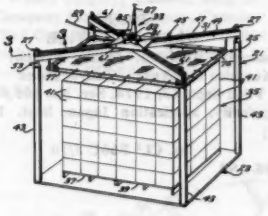
relation to said top plate for releasably retaining said member in the opening of the respective fixture.

3,945,674

LOAD-RETAINING APPARATUS

Allan R. Ide, Cypress, Calif., assignor to Metropolitan Stevedore Company, Wilmington, Calif.

Filed Jan. 22, 1975, Ser. No. 543,038
Int. Cl.² B66C 1/16
U.S. Cl. 294—67 R 7 Claims



1. Load-retaining apparatus comprising:

a pallet floor for receiving a predetermined load;

a cage mounted on said pallet floor;

a horizontally projecting vertically shiftable retainer for resting on the top of said load to hold it captive on said pallet floor;

lifting arms pivotally mounted on their respective one extremities from said cage and formed on their opposite extremities with respective free ends;

connectors connecting said free ends with said retainer;

retraction means normally retracting said lifting arms to their retracted positions with said free ends thereof holding said retainer elevated from said load;

a hoist device liftable to lift said pallet floor; and

actuating means connected between said hoist device and lifting arms and operable upon hoisting of said hoist device to overcome said retraction means to rotate said lifting arms to lower said free ends to lower said retainer onto said load.

3,945,675

BLOCK LOADER

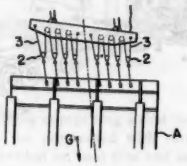
Yoshizo Tsuyama, Nara, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo and Eagle Clamp Co., Ltd., Nara, both of, Japan

Filed June 27, 1974, Ser. No. 483,684

Claims priority, application Japan, May 30, 1974, 49-62975[U]; May 30, 1974, 49-62976[U]; May 30, 1974, 49-62977[U]

Int. Cl.² B66C 1/12

U.S. Cl. 294—81 R 9 Claims



1. A loader for lifting a block with multiple hanging points, comprising a loader body including at least one beam, and at least two movable pulley groups mounted on the beam, each movable pulley group including an array of stationary pulleys arranged along the beam, wire rope fastening means at each end of the array of stationary pulleys, a movable pulley between adjacent ones of the stationary pulleys and between the wire rope fastening means and the stationary pulleys adjacent thereto, respectively, each movable pulley having a hanger ring at one end thereof for attachment to a respective one of the block hanging points, and a wire rope passed alternately over the movable and stationary pulleys, the wire rope having one end thereof attached to one of the fastening means and the other end thereof attached to the other one of the fastening means, whereby the movable pulleys in each group share the load of the block equally.

3,945,676

GRIPPING DEVICE

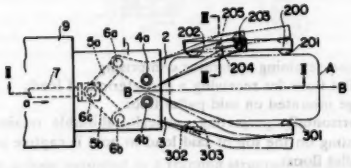
Hiroshi Asamoto, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sept. 13, 1974, Ser. No. 505,846

Claims priority, application Japan, Sept. 14, 1973, 48-107159[U]

Int. Cl.² B66C 3/16

U.S. Cl. 294—88 4 Claims



1. In a workpiece gripping device including a pair of clamp arms pivotally mounted on a base plate, said clamp arms being connected to a clamp arm opening and closing rod through a pair of links, the improvement wherein one of said pair of clamp arms is shorter than the other clamp arm and an additional clamp arm is pivotally connected to said shorter clamp arm, said additional clamp arm including a pin projecting from the surface thereof, said short clamp arm including a long, narrow hole extending in the swinging direction of said additional clamp arm and formed on the surface thereof facing said additional clamp arm in a position opposite to said pin projecting from said additional clamp arm, whereby the pivotal movement of said additional clamp arm is limited by said pin in said slot.

3,945,677

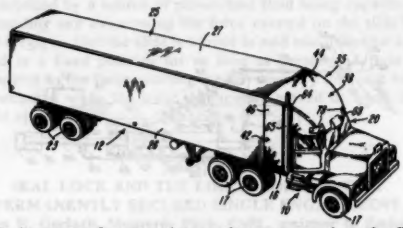
STREAMLINING APPARATUS FOR ARTICULATED ROAD VEHICLE

Ronald A. Servais, Dayton; Paul T. Bauer, Bellbrook, and Alan F. Meckstroth, Dayton, all of Ohio, assignors to Aerospan Corporation, Dayton, Ohio

Filed Aug. 23, 1974, Ser. No. 500,075

Int. Cl.³ B62D 35/00

U.S. Cl. 296—1 S 15 Claims



1. Apparatus for mounting on the upper portion of a first body of a wheel supported road vehicle to reduce the aerodynamic drag produced by a generally vertical front wall of a second body projecting above the first body, said apparatus comprising an air enclosure member defining an air chamber and including a flexible wall, means for mounting said enclosure member on the upper portion of the first body in a position where said flexible wall projects upwardly and rearwardly over the first body and also in front of and toward the front wall of the second body and is exposed to the flow of air over the first body when the vehicle is moving forwardly along a road, said flexible wall being capable of collapsing inwardly in response to the pressure exerted by the flow of air over the first body, means defining a ram air inlet for said air enclosure member and located above the first body, said air inlet being positioned to receive directly a small portion of the air flowing over the first body for pressurizing said chamber with sufficient pressure to avoid collapsing of said flexible wall and to cause the air enclosure member to streamline the flow of air past the first body and the vertical front wall of the second body, and the forward projected area of said inlet is substantially small relative to the forward projected area of said air enclosure member to minimize aerodynamic drag associated with said air inlet.

3,945,678

HARNESS FOR SAFETY SHIELD TYPE CHILDREN'S CAR SEAT

Lewis A. Neuman, 45 Duke Drive, Paramus, N.J. 07652

Filed Sept. 27, 1974, Ser. No. 509,969

Int. Cl.² B60R 21/02

U.S. Cl. 297—390 9 Claims

1. A harness for restricting the vertical movement of a child

seated on a cushion of a safety car seat having a protective front shield, said harness comprising:

a. an openable waist-encircling belt adapted to fit relatively snugly about the child's waist;

b. at least one strap having one of its two ends attached to said belt; and

c. a securing means attached to said safety car seat in front of the vertical center line of the child's upper torso and connected to the other strap end for securing said belt to the safety car seat.

3,945,679

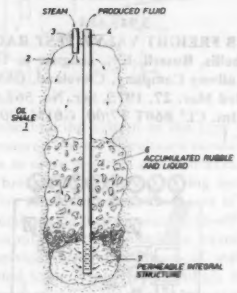
SUBTERRANEAN OIL SHALE PYROLYSIS WITH PERMEATING AND CONSOLIDATING STEPS

Philip J. Closmann; Gary Drinkard; Evan H. Street; Charles C. Templeton, and Min Jack Tham, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 3, 1975, Ser. No. 554,853

Int. Cl.² E21B *43/24*

U.S. Cl. 299—5 **4 Claims**



1. In a process for producing shale oil by circulating hot fluid into and out of a rubble-containing cavern within a subterranean oil shale formation, the improvement comprising:

forming a permeable mass of rubble in and around a portion of the cavern;

consolidating a portion of said rubble into a substantially integral permeable structure by treating it with an intragranular cementforming sand consolidating fluid;

flowing hot fluid into the cavern at a location outside said permeable structure; and

flowing fluid out of the cavern from within said permeable structure so that the outflowing fluid is filtered through that structure.

3,945,680

DRUM COAL CUTTING MACHINE HAVING A ROLLER CRUSHER

Friedhelm Henrich, Bochum-Weitmar, and Willy Lanfermann, Bochum, both of Germany, assignors to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H., Germany

Filed Nov. 14, 1974, Ser. No. 523,734

Claims priority, application Germany, Nov. 17, 1973, 2357559, Mar. 1, 1974, 2409834

Int. Cl.² E21C *35/20*

U.S. Cl. 299—43 **12 Claims**

1. The combination of a conveyor having a support frame adapted to rest upon the footwall of a coal mine and extending in a direction parallel to the working face thereof, and a coal mining apparatus comprising:

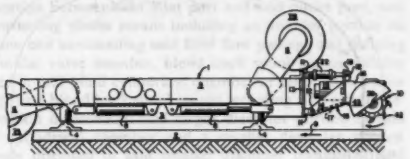
a gantry adapted to travel along on said frame and pass above said conveyor, said gantry having a portal opening for the passage of coal therethrough while transported by said conveyor,

a coal cutting machine carried by said gantry,

a support arm pivotally attached to said machine for movement about a horizontal axis,

a cutter head mounted on said support arm for projecting into the working face of the mine,

means supported by said coal cutting machine and coupled to said support arm to pivotally displace the support arm about said horizontal axis and thereby selectively position said cutting head into a desired projecting relation toward the working face of the mine.



a roller crusher carried by said coal cutting machine independently of said cutter head at the end of said gantry which faces toward and in a generally overlying relation to the oncoming stream of coal carried by said conveyor, said roller crusher being arranged to break down large lumps of coal on said conveyor before passing into the portal opening in said gantry,

a support member rotatably mounting said roller crusher at one end thereof while supported at the other end by said gantry for pivotal movement about a horizontal axis, and

a drive motor carried by said support member to rotate only said roller crusher.

3,945,681

CUTTER ASSEMBLY

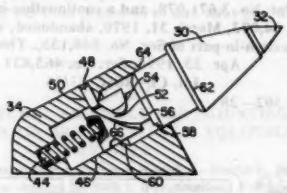
Kenneth M. White, Calgary, Canada, assignor to Western Rock Bit Company Limited, Calgary, Canada

Filed Oct. 29, 1974, Ser. No. 519,014

Claims priority, application Canada, Dec. 7, 1973, 187662

Int. Cl.² E21C *13/00*

U.S. Cl. 299—86 **11 Claims**

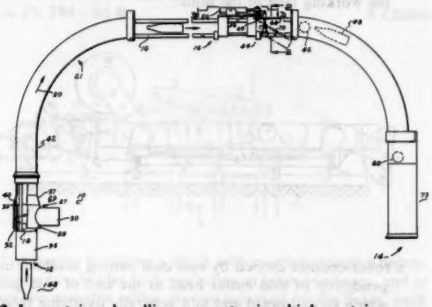


1. A cutter assembly comprising a cutter bit rotatably mounted in a holder, longitudinally and angularly extending groove means fixed in position relative to one of the cutter bit and the holder, follower means positioned in the other of said holder and cutter bit, said follower means co-operating with said groove means to effect axial and rotative movement of said cutter bit relative to said holder when said cutter bit is axially moving from a fully extended to a fully depressed working position, said rotative movement of said cutter bit being less than one full revolution when said cutter bit moves axially from said fully extended to said fully depressed working position.

3,945,682
METHOD AND APPARATUS FOR TRANSFERRING ARTICLES

John C. Hoagland, Windsor, Conn.; Robert Rutkowski, Northampton, Mass., and Jon D. Yonko, Vernon, Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 4, 1974, Ser. No. 520,462
Int. Cl.² B65G 53/04, 47/00
U.S. Cl. 302—12 23 Claims



2. In container handling apparatus in which containers are discharged into a conveying duct assembly, the combination therewith of:

A. container presenting means having partition members forming a series of container pockets continuously rotatable in a generally horizontal plane and successively movable beneath an opening of said duct assembly;

B. pocket loading means synchronized with the movement of said pockets for delivering containers thereto at regular intervals from said opening;

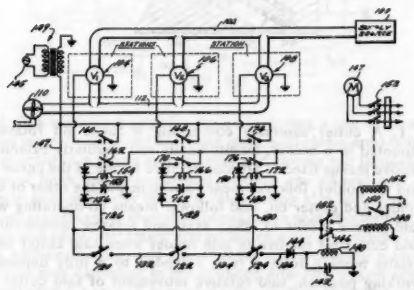
C. eductor means operatively associated with a receiving opening in said duct assembly for urging said containers toward said pocket loading means; and

D. dump gate means between the eductor means and pocket loading means.

3,945,683
PRIORITY INTERRUPT CIRCUIT

Cecil S. Wise, Dallas, N.C., assignor to Fiber Controls Corporation, Gastonia, N.C.

Continuation-in-part of Ser. No. 250,248, May 4, 1972, Pat. No. 3,901,555, which is a division of Ser. No. 848,133, July 9, 1969, Pat. No. 3,671,078, and a continuation-in-part of Ser. No. 24,083, March 31, 1970, abandoned, which is a continuation-in-part of Ser. No. 848,133,. This application Apr. 23, 1974, Ser. No. 463,431
Int. Cl.² B65G 53/66
U.S. Cl. 302—28 17 Claims



15. A method of feeding material from at least a single source to a plurality of stations having a set priority for receiving said material so as to prevent overfill of any said station during purging of at least a single pneumatic line connecting said source and stations, each station having means for extracting said material and means for indicating demand and no demand for said material comprising the steps of:

supplying material to said line whenever at least one of said indicating means indicates a demand for said material,

operating one at a time in an order determined by said set priority said extracting means of each of said stations having an indicating means indicating a demand for said material when checked and when all stations of said plurality of stations having a higher priority are not indicating a demand for fibers so that a cycle is completed after all of said indicating means indicate no demand for said material,

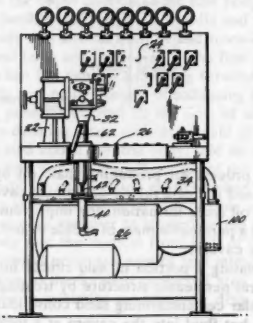
interrupting the feeding of a station whenever a station having a higher priority indicates a demand and operating the said extracting of said station having a higher priority, and

operating after the completion of each cycle, one of only the said extracting means operated within a given number of past cycles so as to purge said line.

3,945,684
AB FREIGHT VALVE TEST RACK

Willard B. Chellis, Russell, Ky., assignor to The Chesapeake and Ohio Railway Company, Cleveland, Ohio

Filed Mar. 27, 1975, Ser. No. 562,672
Int. Cl.² B60T 17/00; G01M 3/00
U.S. Cl. 303—1 4 Claims



1. In an AB test rack having means for mounting an AB service portion with a duplex release valve and an AB emergency portion with a quick action exhaust port, a source of air under pressure, and valve means for connecting other ports of said portions to said source and to the atmosphere to carry out standard tests, the improvement comprising a manifold, a first quick connector for coupling, when actuated, said duplex valve of a mounted service portion to said manifold, said first connector including an air cylinder, means for connecting said air cylinder to said source, a connecting valve mounted for movement with said cylinder into a position engaging said duplex valve and having an interior path for conducting air exiting from said duplex valve to an outlet, and means for connecting said outlet to said manifold, a second quick connector for coupling, when activated, said quick action exhaust port of a mounted emergency portion to said manifold, said second connector including a second air cylinder, means for connecting said second cylinder to said source, a second connecting valve mounted for movement with said second cylinder into a position engaging said quick action exhaust port and having an interior path for conducting air exiting from said quick action exhaust port to an outlet, and means for connecting said outlet of said second connecting valve to said manifold, a muffler having an inlet and outlet and a plu-

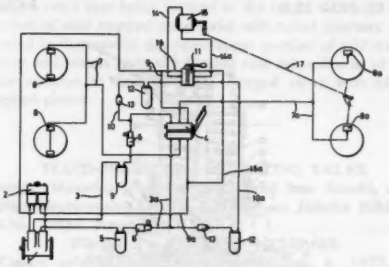
rality of aperture baffle plates therein defining a path between said inlet and outlet, and means for connecting said manifold to the inlet of said muffler.

3,945,685

FULL-POWER HYDRAULIC BRAKING SYSTEMS

Wilbur Mills Page, and Phillip Applewhite, both of Lincoln, England, assignors to Clayton Dewandre Company Limited, Lincoln, England

Filed Dec. 5, 1974, Ser. No. 529,957
Int. Cl.² B60T *13/58*
U.S. Cl. 303—2 **4 Claims**



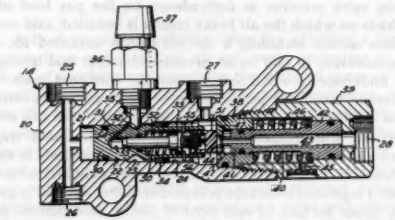
1. In a hydraulic braking system of the type wherein two independently powered service circuits are connected through dual valve means to serve separate sets of brakes, said system including spring brake actuator means having operative brake linkage connection to at least one of said sets of brakes, said actuator means embodying two separate hold-off pistons having a common output to said brake linkage, branch lines from the respective service circuits upstream of said dual valve means and adapted to be connected to supply hold-off fluid pressure to the respective pistons of said actuator means, and manual dual valve means in said branch line connections for selectively connecting either of said branch lines to said actuator means.

3,945,686

BLEND BACK PROPORTIONING VALVE

Edward S. Orzel, Cleveland, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed Nov. 29, 1973, Ser. No. 419,998
Int. Cl.² B60T *8/26*
U.S. Cl. 303—6 C **3 Claims**



1. A blend back proportioning valve comprising a housing having an inlet port, an outlet port, a bore in said housing between said inlet port and said outlet port and extending beyond said inlet port in a direction away from said outlet port, switch piston means slidably disposed in said bore for movement in response to a fluid pressure unbalance on opposite ends of said switch piston means, said switch piston means including a blind cylindrical chamber extending axially from one of its ends, said blind cylindrical chamber within said switch piston means including a larger diameter portion adjacent said one end and a smaller diameter portion spaced away from said one end, proportioning piston means slidably disposed in said bore between said inlet port and said outlet port in axially aligned relation to said switch piston means, said proportioning piston means having a smaller lateral cross-sectional area exposed to inlet port pressure and a larger lateral cross-sectional area exposed to outlet port pressure, a first spring biasing said proportioning piston means toward said outlet port, a fluid flow passage extending from one end of said proportioning piston means at least partially through said proportioning piston means establishing fluid pressure communication between said inlet port and said outlet port, said proportioning piston means including an annular portion on said one end surrounding said fluid flow passage and defining an annular valve member, blend back spool means slidably carried in said blind cylindrical chamber of said switch piston means, said blend back spool means including a larger diameter portion disposed in said larger diameter portion of said blind cylindrical chamber and a smaller diameter portion sealingly disposed in said smaller diameter portion of said blind cylindrical chamber, said smaller diameter portion of said blind cylindrical chamber being vented to atmospheric pressure and said smaller diameter portion of said blend back spool means including a net lateral cross-sectional area exposed to atmospheric pressure under all conditions, a spring disposed in said larger diameter portion of said blind cylindrical chamber exteriorly of said blend back spool means, said spring acting against said larger diameter portion of said blend back spool means to urge said blend back spool means in a direction toward said annular valve member, a valve seat slidably carried on said blend back spool means adjacent said larger diameter portion of said blend back spool means, another spring carried by said blend back spool means and acting against said valve seat to urge said valve seat in a direction toward said annular valve member, said valve seat being spaced from said annular valve member to open said fluid flow passage when the fluid pressure in said inlet port is less than a first predetermined pressure, said proportioning piston means moving said annular valve member to a position adjacent said valve seat to at least partially close said fluid flow passage when said first predetermined pressure is reached, said proportioning piston means maintaining increases in outlet port pressure proportional to but less than increases in inlet port pressure when said inlet port pressure is greater than said first predetermined pressure and is less than a second predetermined pressure, and said blend back spool means moving said valve seat away from said valve member when said second predetermined pressure is reached in said inlet port to equalize the fluid pressures in said inlet port and said outlet port.

3,945,687

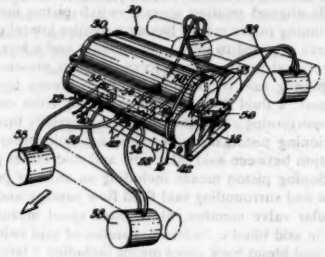
STRUCTURAL ASSEMBLY FOR MOUNTING COMPRESSED AIR BRAKE ANTI-SKID EQUIPMENT ON VEHICLE

Andrew Abolins, Langhorne, and Joseph A. Bertsch, Reading, both of Pa., assignors to Strick Corporation, Fairless Hills, Pa.

Filed May 22, 1975, Ser. No. 580,028
Int. Cl.² B60T *17/00*
U.S. Cl. 303—21 R **12 Claims**

1. A structural assembly for mounting anti-skid braking equipment including compressed air tanks with attached pneumatic controls and electrical controls on a wheeled vehicle comprising an elongated housing frame having short ends, relatively long sides and a pair of open rims, projections on the frame for securing it to the vehicle, tank receiving surfaces on the ends of the frame, the air tanks being disposed over one rim of the frame engaged with the tank receiving surfaces and disposed parallel to the sides of the frame, attaching means securing the tanks to the frame with the attached pneumatic control elements being disposed within the housing, the elec-

trical control elements being disposed within the housing, a cover panel being disposed upon the other rim of the housing



for covering it, and fastening means securing the cover panel to the housing.

3,945,688

BRAKE PRESSURE CONTROL VALVES

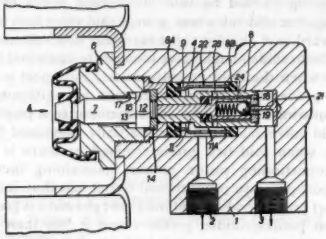
Glyn Phillip Reginald Farr, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed May 23, 1974, Ser. No. 472,877

Claims priority, application United Kingdom, May 23, 1973, 24586/73; June 21, 1973, 29563/73

Int. Cl.[2] B60T 8/22

U.S. Cl. 303—22 R 7 Claims



1. A fluid pressure brake control valve comprising a housing having an inlet and an outlet; an internal valve set within said housing for controlling communication between said inlet and said outlet; a load conscious member for transmitting an external load to said valve set tending to hold it open, first fluid pressure responsive means exposed to pressure at said outlet and having an operative connection with said valve set tending to close it in response to pressure at said outlet in opposition to the external load transmitted thereto by said load conscious member, another movable valve part in said housing having an operative connection with said load conscious member enabling said other movable valve part and said load conscious member to move in unison or to move relatively with respect to each other, means operable in response to movement of said load conscious member in one direction relative to said other movable valve part to establish free fluid communication between said inlet and said outlet, means operable in response to movement of said load conscious member in unison with said other movable valve part for preventing said operable means from establishing said free communication between said inlet and said outlet so long as the external load acting on said member exceeds a predetermined value, and second fluid pressure responsive means exposed to pressure at said inlet and operatively connected to said load conscious member to move it in said one direction relative to said other movable valve part in response to pressure at said inlet when the external load acting on said member falls below a predetermined value thereby rendering said other movable value part operable to establish said free communication between said inlet and outlet.

3,945,689

COMBINED LOAD-SENSING PROPORTION AND RELAY VALVE

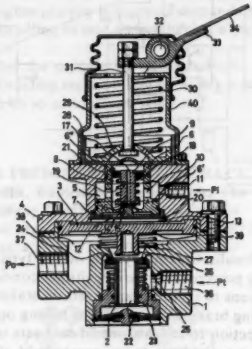
Naosuke Masuda, and Itiro Yanagawa, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Japan

Filed Oct. 21, 1974, Ser. No. 516,754

Claims priority, application Japan, Nov. 28, 1973, 48-133263

Int. Cl.[2] B60T 8/18

U.S. Cl. 303—22 R 3 Claims



1. A combined load-sensing proportion and relay valve for an air brake circuit comprising a valve body formed with a supply pressure inlet for connection to a source of air under pressure, an operating pressure outlet for connection to the air brakes, and an indicated pressure inlet for connection to a brake valve; a main valve member mounted in said body for axial displacement therein and controlling communication between said supply pressure inlet and said operating pressure outlet, said main valve member being formed with an axial exhaust passage therein; means normally biasing said main valve member to a closed state blocking communication between said supply pressure inlet and said operating pressure outlet; said body being formed with an outlet pressure chamber communicating with said outlet pressure outlet and with an indicated pressure chamber communicating with said indicated pressure inlet; control piston means for opening said main valve member in dependence on the pay load of the vehicle on which the air brake circuit is installed; said control piston means including a control piston mounted for axial displacement in said outlet pressure chamber and having, on its underside, a valve seat cooperable with said main valve member, a stepped piston mounted for axial displacement in said indicated pressure chamber and formed with two coaxial portions with respective different diameters, said stepped piston being located substantially coaxially with, and in spaced relation to, said control piston; said body being further formed with a regulated indicated pressure chamber defined in part by the upper surface of said control piston; said control piston means further including valve means adapted to be opened and closed by axial movement of said stepped piston to control the indicated pressure applied to the upper surface of said control piston and to said stepped piston, and loading compression spring means engaging the upper end of said stepped piston and having its compressive force adjustable in accordance with the pay load of the vehicle; said stepped piston being formed with an axial passage therethrough communicating with said indicated pressure inlet through a radial opening into said indicated pressure chamber; said valve means com-

prising a valve seat flanged inwardly of the lower end of said axial passage through said stepped piston; an apertured stopper plate interposed between said control piston and said stepped piston and limiting movement of said stepped piston toward said control piston, said stopper plate having an upwardly extending axial protrusion formed with an exhaust valve seat on its upper end and cooperating with said inwardly flanged valve seat to control communication between said indicated pressure chamber and said regulated indicated pressure chamber which latter is located between said control piston and said stepped piston; a sub-valve mounted for axial displacement in said axial passage through said stepped piston and cooperable with said inwardly flanged valve seat and said valve seat on the upper end of said protrusion; said inwardly flanged valve seat being formed in the larger diameter lower portion of said stepped piston and said radial aperture being formed in the smaller diameter upper portion of said stepped piston and means normally biasing said sub-valve to an open state relative to said inwardly flanged valve seat of said stepped piston.

3,945,690

FLUID-PRESSURE REGULATING VALVE

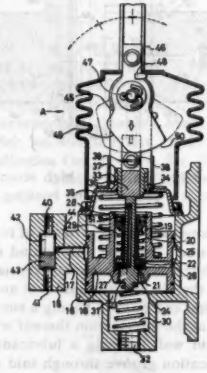
Naosuke Masuda; Itiro Yanagawa, and Isao Suzuki, all of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1974, Ser. No. 530,608

Claims priority, application Japan, Dec. 6, 1973, 48-136654; Dec. 6, 1973, 48-136655

Int. Cl.² B60T *8/22*

U.S. Cl. 303—22 R **6 Claims**



1. A fluid-pressure regulating valve for adjusting a supply pressure from either of two air reservoirs according to the payload of a vehicle and supplying the adjusted pressure to a control pressure chamber in pressure-proportioning relay valve, the regulating valve comprising: a valve assembly for controlling the supply pressure, said assembly including a pressure piston reciprocably disposed in the valve body and formed with an air passage through the wall on one side, a supply valve accommodated in a supply pressure chamber inside the pressure piston and seated on a valve seat provided at the lower end of the supply pressure chamber, and an exhaust valve having an exhaust valve seat engageable with the supply valve and also having an upward protrusion extended through an exhaust bore formed in the axial center of the supply valve; an output pressure chamber defined between the underside of the pressure piston and the inner wall of the valve body; a balance spring disposed above the pressure piston in communication with the atmosphere to offset the upward force developed by the output pressure to raise the pressure piston; and a loading spring disposed under the exhaust valve to bias the supply valve into the open position via the exhaust valve; said upward protrusion of the exhaust valve being linked at its end with a linkwork movable in response to the vehicle payload.

3,945,691

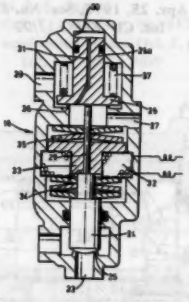
FULL-POWER HYDRAULIC BRAKING SYSTEMS

Wilbur Mills Page, and Phillip Applewhite, both of Lincoln, England, assignors to Clayton Dewandre Company Limited, Lincoln, England

Filed Dec. 5, 1974, Ser. No. 529,958

Int. Cl.² B60T *17/18*

U.S. Cl. 303—84 R **9 Claims**



9. A hydraulic braking system of the kind in which two independently powered service circuits are connected through valve means to serve separate sets of wheel brakes, wherein the system includes a spring brake actuator fed to receive fluid pressure from both service circuits through separate control circuit lines each incorporating a pressure responsive protector valve operable in the event of a failure of pressure in the associated spring brake actuator control circuit line to cut off that control circuit line and so maintain the integrity of the two service circuits.

3,945,692

HIGH RIGIDITY FLUID BEARING AND METHOD FOR MANUFACTURING THE SAME

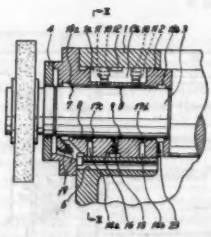
Toshio Tsujiuchi, Anjo, Japan, assignor to Toyoda-Koki Kabushiki Kaisha, Japan

Filed Oct. 16, 1974, Ser. No. 515,329

Claims priority, application Japan, Oct. 30, 1973, 48-122106

Int. Cl.² F16C *29/00*

U.S. Cl. 308—9 **2 Claims**



1. A fluid bearing adapted to rotatably support a rotary shaft on a stationary base and provided with a bearing bushing including a plurality of fluid pockets spaced apart in the circumferential direction, a land portion surrounding said plural-

ity of fluid pockets, and throttle means connected to said fluid pockets for admitting a pressurized fluid to the same, the improvement of said bearing bushing comprising:

a raised land formed in each of said fluid pockets, a portion of said raised land protruding toward the outer periphery of said rotary shaft beyond the surface of said land portion so as to form a wedged-shape clearance therebetween, and

a deformable portion formed around said raised land.

3,945,693

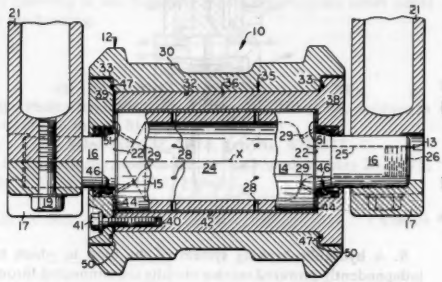
TRACK ROLLER

Sterling R. Booth, Jr., Yates City, and Kenneth A. Rhoads, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 25, 1975, Ser. No. 571,900

Int. Cl.² F16C *13/02*

U.S. Cl. 308—20 **12 Claims**



1. A track roller comprising:

a stepped diameter shaft having a pair of spaced shoulders;

an outer track engaging rim rotatably mounted on said shaft and having a pair of opposite end faces individually substantially alignable with said shoulders on the shaft; and

rim clamping and positioning means disposable in opposing sliding relation against said shoulders of the shaft and having a sleeve portion extending in full load bearing relation between said shoulders and a pair of opposing clamping surfaces each positionable in facing, tightly clamping relation against respective ones of said pair of end faces of the rim for limiting relative axial movement between said rim and the shaft.

3,945,694

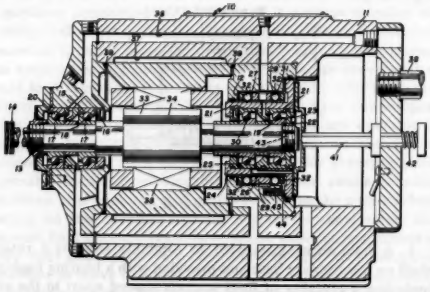
TOOLHEAD

Bernard D. Vaillette, Leominster, Mass., assignor to Cincinnati Milacron-Heald Corporation, Worcester, Mass.

Filed Nov. 4, 1974, Ser. No. 520,410

Int. Cl.² B24B *41/00*

U.S. Cl. 308—184 A **5 Claims**



1. A toolhead comprising

a. a housing having a bore extending therethrough,

b. a spindle rotatably mounted in the bore and extending therefrom,

c. a first anti-friction bearing at one end of the spindle between the spindle and the bore, the bearing having an outer race fixed in the bore, an inner race fixed on the spindle, and rolling elements therebetween,

d. a second anti-friction bearing at the other end of the spindle between the spindle and the bore, the bearing having an outer race, an inner race, and rolling elements therebetween,

e. a sleeve mounted in the bore for sliding movement in the axial direction, the outer race of the second anti-friction bearing being fixed in the sleeve and the corresponding inner race being fixed to the spindle, and

f. two axially-spaced rows of rolling elements residing between the sleeve and the bore to allow the said sliding movement, each row consisting of a plurality of rolling elements in the form of barrel-shaped rollers, the axis of each roller being tangential to a circle concentric with the spindle.

3,945,695

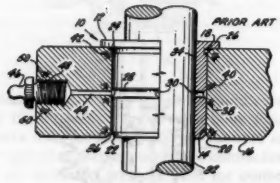
FATIGUE BUSHING ASSEMBLY

Eugene R. Speakman, Fullerton, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Mar. 31, 1975, Ser. No. 563,738

Int. Cl.² F16C *1/24*

U.S. Cl. 308—240 **16 Claims**



1. A bushing assembly for use in high strength housings where fatigue failure is a problem, the bushing assembly including:

a bushing having inner and outer surfaces of revolution with a wall therebetween and first and second end portions, said inner surface having a circumferential lubrication groove defined therein between said first and second end portions, said first end portion having a smooth radiused corner portion at the intersection thereof with said outer surface and said wall defining a lubricant passageway from said lubrication groove through said outer surface for transmission of lubricant to said lubrication groove.

3,945,696

MEANS FOR CONVERTING AN OPEN-SHELVED UNIT OR ETAGERE TO A CLOSED CABINET WITH SLIDABLE DRAWERS

Bernard Yellin, 5252 S. Kolmar Ave., Chicago, Ill. 60632

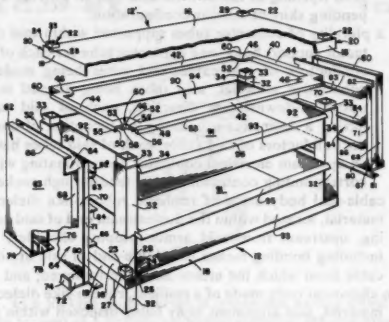
Filed Jan. 24, 1975, Ser. No. 543,669

Int. Cl.² A47B *47/00*, *57/08*

U.S. Cl. 312—257 R **7 Claims**

1. Means for converting an open-shelved unit to a closed cabinet with a slidable drawer, said open-shelved unit comprising, a top horizontal member and a bottom horizontal member, each said horizontal member having means adjacent the corners thereof for detachably receiving an upright whereby said uprights when attached to said top and bottom horizontal members space said top and bottom horizontal members and connect same; the means for converting said open-shelved unit to a closed cabinet with slidable drawer comprising a pair of end panels positioned at each end be-

tween said bottom and top horizontal members and said uprights, each said pair of end panels comprising an outer and an inner end panel with said inner panels having means engaging a pair of spaced uprights to position said inner end panels relative to said uprights, each said inner end panel having an outwardly extending bottom flange providing a channel for receiving and holding the bottom of the outer panel to hold



said outer panel relative to said inner panel and secure same to said open-shelved unit, a groove or channel adjacent the underside of said top horizontal member for receiving and holding the top of the outer panel, a slidable drawer, each said inner end panel having means for receiving said slidable drawer to permit the drawer to be manually slid into and out of said unit.

3,945,697

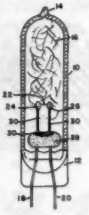
METHOD OF MANUFACTURING A PHOTOFLASH LAMP HAVING AN INDICATOR-INSULATOR

Donald E. Armstrong, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Division of Ser. No. 406,389, Oct. 15, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 512,772

Int. Cl.[2] H01J 9/00

U.S. Cl. 316—17 **4 Claims**



1. A method of making a photoflash lamp comprising:

locating an ignition assembly including a pair of lead-in wires within a length of glass tubing with said lead-in wires projecting from one end of the tubing;

sealing the end of the glass tubing from which said lead-in wires project;

dipping a portion of the ignition assembly within said glass tubing into a liquid preparation of moisture indicating material comprising a mixture of cobaltous cobalticyanide and a colloidal magnesium silicate, said moisture indicating liquid being contained in a tube which fits through the open end of said glass tubing during said dipping step;

drying the moisture indicating material thereby coated on said ignition assembly;

dipping end portions of the lead-in wires within said glass tubing into a liquid preparation of primer, and after drying of the primer beads thereby formed,

filling the glass tubing with a quantity of filamentary combustible material and a combustion-supporting gas, and tipping off the tubing to provide an hermetically sealed envelope.

3,945,698

METHOD OF STABILIZING EMITTED ELECTRON BEAM IN FIELD EMISSION ELECTRON GUN

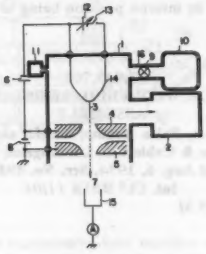
Satoru Fukuhara, Kokubunji; Shigehiko Yamamoto, Tokorozawa, and Hiroshi Okano, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 7, 1974, Ser. No. 512,925

Claims priority, application Japan, Oct. 5, 1973, 48-111457

Int. Cl.[2] H01J 9/00

U.S. Cl. 316—26 **10 Claims**



1. A method of stabilizing the emitted electron beam in a field emission electron gun comprising a first step of introducing an amount of hydrogen gas into a vacuum vessel containing a field emission cathode tip to a partial pressure of 5×10^{-7} to 1×10^{-9} Torr, and a second step of effecting heat treatment of the cathode tip.

3,945,699

ELECTRIC CONNECTOR APPARATUS AND METHOD

Arthur C. Westrom, Stone Mountain, Ga., assignor to Kearney-National Inc., Atlanta, Ga.

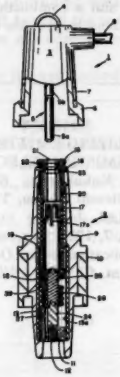
Filed Sept. 27, 1974, Ser. No. 509,959

Int. Cl.[2] H01R 11/30

U.S. Cl. 339—12 R **11 Claims**

1. Electric connector apparatus comprising hollow elongated support structure, a tubular electric contact mounted within said support structure and movable longitudinally relative thereto between a normal closed circuit position and an interim position, said interim position being spaced longitudinally from said normal position, and magnetic means interconnected with said contact and operable in coordination with the initiation of the flow of electric current therethrough for

moving said contact from its normal position toward its interim position, movement of said contact from its normal



position toward its interim position being in a circuit closing direction.

3,945,700

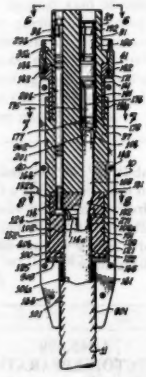
CONNECTOR WITH FLUID-RESISTANT SLEEVE ASSEMBLY

Robert G. Didier, Palos Verdes, Calif., assignor to Boston Insulated Wire & Cable Co., Los Angeles, Calif.

Filed Aug. 6, 1974, Ser. No. 495,181

Int. Cl.² H01R *11/04*

U.S. Cl. 339—59 M **17 Claims**



1. An electrical connector for connecting an armored cable, with multiple conductors to a feed through socket;

a substantially cylindrical housing made of rigid material and axially aligned with said armored cable, said housing having an upstream end adjacent said socket and a downstream end adjacent said cable;

an armor-gripping shoulder at the downstream end of said housing, said shoulder providing an internal surface, substantially cylindrical, closely fitting the exterior surface of the armor of said armored cable;

means at the upstream end of said housing for securely fastening said electrical connector to said feedthrough socket;

a contactor assembly comprising;

a contactor support body made of a resilent rubber-like, dielectric material, said body substnatially filling the upstream portion of said housing, said body having an axial opening in the downstream end to provide a depending skirt of tubular configuration;

a plurality of contactor tubes supported within said contactor support body, one contactor tube for each of the conductors of said cable, said tubes being made of conductive material, said tubes being aligned in an upstream-downstream direction, each of said tubes having a downstream opening for reception of one of the conductors of said cable, each of said tubes having an upstream electrical contactor portion mating with a corresponding contactor in said feedthrough socket;

a cable-seal body made of resilient, rubber-like dielectric material, located within the downstream end of said housing, upstream from said armor-gripping shoulder, and including bonding means to a cable-end of said armored cable from which the armor has been removed; and

an alignment body made of a resilient, rubber-like dielectric material, said alignment body being disposed within said axial opening at the downstream end of said contactor support body and said alignment body having passages to accommodate the conductors from said cable end, and to place them in disposition for entrance into said contactor support body, to make electrical contact with the downstream ends of said contactor tubes.

3,945,701

WATER-TIGHT CONNECTORS FOR ELECTRIC CABLES

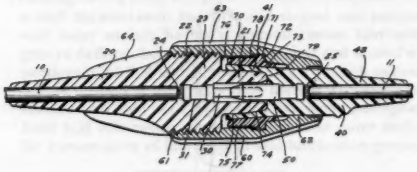
Uwe Boeke, Nordenham; Lothar Roland Hennemann, Enger; Wolfgang Hohorst, Minden, and Horst Urban, Nordenham, all of Germany, assignors to Norddeutsche Seekabelwerke AG, Nordenham, Germany

Filed Apr. 8, 1974, Ser. No. 458,858

Claims priority, application Germany, Apr. 9, 1973, 2317700

Int. Cl.² H01R *13/52*

U.S. Cl. 339—60 R **18 Claims**



1. An underwater cable connector having cooperating portions which are required to be engageable and dieengageable while in submerged condition, comprising longitudinally aligned contact carriers having annular sealing portions engaging each other one of said sealing portions surrounding the other of said sealing portions and being formed of a material having a greater elasticity than said other sealing portion; mutually mating cable contact members on said carriers and being surrounded by said sealing portions; and means for expelling water from said cable contact members in response to engagement of said contact carriers so as to expel water from between said sealing portions and prevent the existence of an electrically-conductive film of water which would otherwise establish a current path connecting the cooperating portions of the cable connector with the surrounding body of water.

3,945,702
TWIST-TYPE ELECTRICAL CONNECTOR WITH SAFETY INTERLOCK

John M. Poliak, East Meadow, and Juan M. Lopez, New York, both of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.

Filed Oct. 15, 1974, Ser. No. 514,554
Int. Cl.² H01R 13/54
U.S. Cl. 339—88 R 4 Claims

1. In a locking type electrical connector having a two part body formed of a flexible insulating material, the combination comprising:

a. a two part connector body comprising a plug and a mating receptacle;

b. said plug and receptacle carrying mating electrical contacts in the form of male blades and female contacts, said blades and contacts being angularly rotatable relative to each other for electrical engagement and disengagement;

c. said receptacle having a face with spaced entrance slots permitting introduction of the blades into said receptacle; and

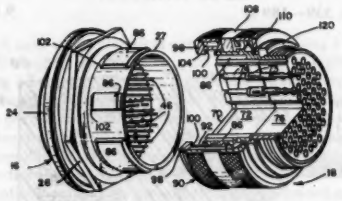
d. detent means located on said face in at least one slot in said receptacle for engaging with a rear edge of one of the blades carried by said plug when the plug and receptacle contacts are rotated into engagement with each other;

e. said detent means being spaced angularly relative to one of the female contacts.

3,945,703
SNAP ACTION CONNECTOR

Larry L. McCormick, Los Angeles, Calif., assignor to G & H Technology, Inc., Santa Monica, Calif.

Continuation of Ser. No. 326,460, Jan. 24, 1973, abandoned. This application Dec. 23, 1974, Ser. No. 535,291
Int. Cl.² H01R 13/54
U.S. Cl. 339—89 M 21 Claims



1. The combination of

a plug section,

a receptacle section effective to mate with said plug section,

means for releasably securing said plug and receptacle sections together,

a movable portion on one of said sections, said portion being movable relative to said section between a fully mated position and a fully unmated position,

complementary threads on at least one of said sections for moving said sections between the fully mated position and the fully unmated portion, said threads having a predetermined amount of clearance therebetween whereby said sections may move axially relative to each other by said amount,

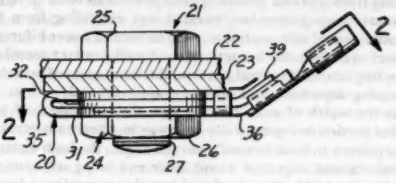
said clearance being so large that the threads do not engage when said portion is in the fully mated position and said spring is free to resiliently bias the portion into the fully mated position, and

a spring effective to coact with said sections and create an axial force tending to maintain said portion biased into the fully mated position.

3,945,704
DEVICE FOR DETECTING AN APPLIED COMPRESSIVE LOAD

Robert A. Kraus, 14160 Red Hill Blvd, Tustin, Calif. 92680, and Edmund J. Kraus, 2601 Orion, Santa Ana, Calif. 92704

Filed Mar. 28, 1974, Ser. No. 455,637
Int. Cl.² H01R 9/08
U.S. Cl. 339—97 C 26 Claims

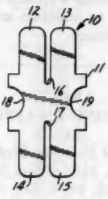


1. A one-shot compressive-load sensitive electrical circuit element which changes from an electrically non-conductive condition to a conductive condition when a compressive load of predetermined magnitude is applied thereto, comprising: a first and a second electrically conductive metallic member, the first of said members being made of material which is harder and less ductile than the material of the second member, a first substantially planar face on the first member, a second substantially planar face on the second member, a wall receding from the first planar face at an angle thereto, said wall at least partially defining an open region adjacent to the first face, a substantially flat insulation layer between the faces, the faces being opposed to and facing one another across the insulation layer, and being contiguous thereto, the faces being the closest portions of the members to one another so as to function to hold the members apart in a compressive substantially non-yielding stack while the insulation layer remains unbroken at said second planar face adjacent to the wall, and said insulation layer extending beyond the wall and over the open region, the material of the insulation layer being hard and brittle, and of such thickness that, when the members are pressed toward each other by a compressive load, the insulation layer remains unbroken until said predetermined load, whose magnitude depends at least in part on the physical strength of the insulation layer, is applied, whereupon the insulation layer abruptly fractures adjacent to the wall, and a portion of one of the members moves axially toward the other member, displacing in a shear-like axial movement that portion of the insulation layer which is bounded by the wall, whereby to bring insulation-free metal of both members into contact with each other and thereby to make an electrically conductive contact as a consequence of the application of said load, said members being adaptable to connection into an electrical circuit.

3,945,705
WIRE-SPLICING APPARATUS AND CONTACT ELEMENT THEREFOR

William J. Seim, St. Paul, and Richard D. Kahabka, Village of Burnsville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 9, 1972, Ser. No. 261,361
Int. Cl.² H01R 9/08
U.S. Cl. 339—98 4 Claims

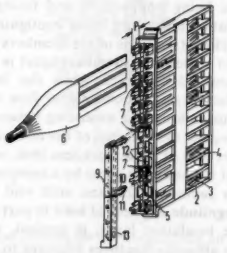


1. A wire-connector having a substantially planar spring compression reserve contact element in an insulating body, wherein said element consists of a flat plate of spring metal having an extended-width central portion, parallel legs extending from one end of said central portion to form an upper bifurcate contact member, parallel legs extending from the opposite end of said central portion to form a lower bifurcate contact member, the central slots of said contact members extending into said central portion, the inner ends of said slots remaining separated by a distance approximately 1.5 to 1.7 times the width of each of said legs, the side edges of said central portion being centrally cut away in a generally semicircular pattern to form inwardly curved edges, the least distance between a said edge and a said inner end being substantially equal to the width of each of said legs thus providing a longer dielectric breakdown path between alternate contact elements.

3,945,706
DISTRIBUTION FRAME FOR COMMUNICATION FACILITIES

Ewald Steiner, Allmannshausen, and Hans Scholtholt, Munich-Tohhof, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 18, 1974, Ser. No. 462,100
Claims priority, application Germany, Apr. 25, 1973, 2320867
Int. Cl.² H01R 300
U.S. Cl. 339—113 L 8 Claims



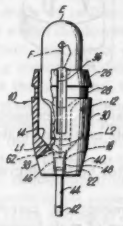
1. In a distribution frame for telecommunication exchange facilities having a plurality of terminal elements forming an extended terminal board, the terminal elements being assigned to transmission lines incoming to and outgoing from said distribution frame, said terminal elements being disposed in rows and columns, the improvement comprising:

designation strips having indicating means thereon for identifying individual terminal elements, said designation strips having means for attaching them to a said terminal board along rows and/or columns of said terminal elements, said designation strips being constructed, when so attached, to project above and over the free ends of said terminal elements, said designation strips having formed therein concave recesses for receiving said terminal elements and in which said terminal elements rest, when said designation strips are attached to said terminal board.

3,945,707
LAMP ASSEMBLY AND CONNECTOR FOR SAME

James J. Fitzgerald, Kinnelon, N.J., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Aug. 2, 1974, Ser. No. 493,875
Int. Cl.² H01R 13/48
U.S. Cl. 339—128 10 Claims

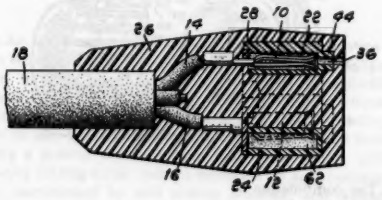


5. A connector defining a cavity for receiving a lamp to be mounted therein, and comprising an annular mounting groove formed in the outer periphery of said connector transverse to the longitudinal axis thereof; a collar portion extending longitudinally from said mounting groove to a large opening into said cavity in the first end of said connector; a body portion extending longitudinally from said mounting groove in the direction opposite said collar portion and tapered down toward first and second small openings into said cavity in the second end of said connector; a plurality of slots extending longitudinally through at least a part of said collar portion, and at least a part of said body portion to permit deformation of said connector adjacent the mounting groove; and wherein a plurality of equally-spaced fins extend radially into said cavity defined by said connector.

3,945,708
ELECTRICAL CONNECTOR WITH PREMOLD

Richard H. Griffin, Riverside, R.I., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Mar. 28, 1975, Ser. No. 563,023
Int. Cl.² H01R 19/28
U.S. Cl. 339—189 R 9 Claims



1. A premold for a molded electrical connector comprising:

an outer cylinder of a relatively high melting point rigid thermoplastic material;

a plurality of hollow passages extending between the opposite ends of said cylinder;

a plurality of inner longitudinal walls separating said passages, said passages and walls being adapted to retain and enclose a plurality of female electrical contact members;

a front face having a plurality of openings at the front end of respective ones of said passages, said openings being adapted to receive a plurality of male connector blades engageable with said female contact members;

an end closure member receivable within the back end of said cylinder, said end closure member having a central opening to receive said plurality of female contact members;

said inner longitudinal walls including an inner cylinder and longitudinal partitions, said passages being disposed radially to receive said contact members between said inner and outer cylinders and said longitudinal partitions;

said openings in said front face being arcuate slots enclosing correspondingly curved female contact members to receive like curved rotatable male connector blades;

said closure member including a plurality of radially positioned notches around said central opening adapted to receive reduced width wire connecting portions of said contact members;

external raised embossments surrounding said arcuate slots on said front face;

one of said arcuate slots including an L-shaped notch adapted to receive a key member of a correspondingly shaped male blade; and

said closure member further including inner shoulders extending around the edges of said central opening between said notches, said shoulders engaging the inner wall of said inner cylinder.

3,945,709

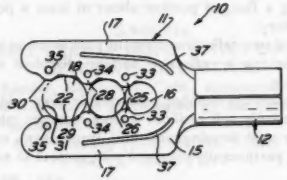
SNAP SPADE ELECTRICAL CONNECTOR AND METHOD OF MANUFACTURE

John Richard Filson, Medford, N.J., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 479,313, June 14, 1974. This application Dec. 5, 1974, Ser. No. 529,899

Int. Cl.² H01R *11/22*

U.S. Cl. 339—257 **11 Claims**



1. A snap spade electrical connector comprising a generally flat U-shaped lug engaging part including a bight portion having a lug receiving open region, and a pair of legs extending longitudinally of each other from opposite ends of said bight portion on opposite sides of said open region and defining therebetween a longitudinally inwardly extending passageway opening into said open region, a pair of opposed inner projections on respective legs spaced from the free ends thereof and extending into said passageway toward and terminating short of each other to define a passageway constriction, said legs and inner projections being generally flat and coplanar with said bight portion, and a work-hardened region located in adjacent conforming relation with each of said projections for reinforcing the latter against repeated snap engagement of a lug through said constriction, said work-hardened regions each comprising a compressed location defining a surface recess on one side and being generally nonprotuberant on the other side.

3,945,710

CONTACT SPRING

Albert J. Gartland, Jr., Trumbull, Conn., assignor to Harvey Hubbell, Incorporated, Orange, Conn.

Division of Ser. No. 283,790, Aug. 25, 1972, Pat. No. 3,867,008. This application Dec. 2, 1974, Ser. No. 528,879

Int. Cl.² H01R *13/12*

U.S. Cl. 339—258 R **11 Claims**

1. An electrical female contact comprising: a pair of spring members integrally connected and disposed to deflect in opposite directions away from a central plane as straight male contacts are engaged therebetween, said spring members having base ends of similar generally rectangular configuration and free ends, means fixedly mounting the base ends so as to be in substantially parallel, spaced-apart relationship with said base ends mutually opposed substantially symmetrically with respect to said central plane and substantially coincident throughout their configurations, each said spring member having a contact surface and an outwardly inclined tip, portions of said spring members between said outwardly inclined tips and said base ends being inclined inwardly toward said central plane, said contact surfaces on said opposite spring members being separated across the thickness of engaging male contacts and bearing thereagainst with a contact pressure of proportional magnitude to the deflection incurred by said spring members, said inclined tips being complementarily oriented to create a guided entrance across the full width of male contact engagement along said central plane, at least one of said spring members having an advanced section disposed thereon and aligned to pass through said opposite spring member across said central plane prior to deflection of said spring members, said advanced section having a contact surface disposed thereon at an offset distance from said central plane, said offset contact surface moving through said offset distance across said central plane during engagement of said female contact by male contacts, the contact pressure on said contact surfaces of said opposite spring members being proportional to the total deflection of said advanced section with that total deflection being equal to said offset distance plus the thickness of the male contact.

3,945,711

SCREWLESS CONNECTOR OR COUPLING FOR ELECTRIC LEADS

Wolfgang Hohorst, Minden, and Hans-Josef Kollmann, Vlotlage, both of Germany, assignors to Wago-Kontakttechnik GmbH, Minden, Germany

Filed Apr. 4, 1974, Ser. No. 457,968

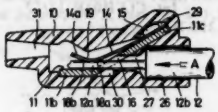
Claims priority, application Germany, Apr. 5, 1973, 2317040

Int. Cl.² H01R *11/20*

U.S. Cl. 339—95 D **23 Claims**

1. A screwless connector or coupling for electric leads, having a clamping spring located in an insulating material housing and retained therein, forming with a contact bridge at least one conductor clamping position, wherein the contact bridge and the clamping spring are substantially flat and are interconnected at a common end region to form a self-supporting unitary structure, the contact bridge being provided at

a point spaced from the point where the contact bridge and clamping spring are connected with a plurality of conductor bush openings arranged in spaced juxtaposition, the clamping



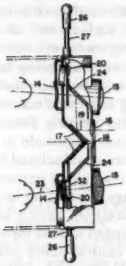
spring in the region of each contact bridge bush opening having at least one clamping edge located behind the contact bridge clamping spring interconnection in the insertion direction of the conductor.

3,945,712

OPERATING MAGNIFIER AND MINIATURE OPTHALMOSCOPE

Gerard William Crock, Kew, and Ljubomir Pericic, Alphington, both of Australia, assignors to University of Melbourne, Melbourne, Australia

Filed May 31, 1974, Ser. No. 474,925
Int. Cl.² A61B 3/12; G02B 25/02
U.S. Cl. 351—6 5 Claims



1. An operating magnifier and miniature ophthalmoscope having a body, means on the body for retaining the instrument on a user's head, two carriages mounted in the body, each carriage being movable between two positions, in the first position each carriage providing a first optical path through the instrument which path includes an objective and an eye piece, the objective being a magnifying lens, and in the second position each carriage providing a second optical path which path comprises a first silvered mirror directed towards the centre of the instrument, a second parallel silvered mirror on the centre line of the instrument and an objective.

3,945,713

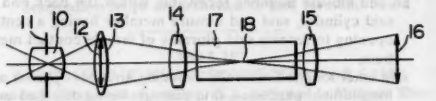
IMAGE ROTATING OPTICAL SYSTEM

Yoshikazu Doi; Toshiro Kishikawa, both of Omiya, and Hiroshi Yamada, Tokyo, all of Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed July 29, 1974, Ser. No. 492,880
Claims priority, application Japan, July 28, 1973, 48-85324
Int. Cl.² G02B 23/02
U.S. Cl. 350—54 7 Claims

1. In an optical system including an objective lens to form an image on a first focusing plane and a relay lens system comprising at least a front lens and a rear lens for carrying the image focused on said first focusing plane to a second focusing plane, an image rotating optical system comprising,

an image rotating prism system having an odd number of reflecting faces in total for rotating an image formed with the light passing therethrough by the rotation thereof around the optical axis of said light, said image rotating prism being located between said front lens and said rear lens of the relay lens system, and



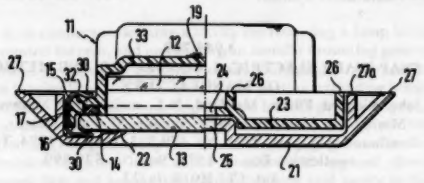
a field lens located on said first focusing plane, the focal length of said field lens and said front lens of the relay lens system being selected to position the pupil of the relay lens system conjugate with the aperture of the objective lens at substantially the center of the optical path of said image rotating prism.

3,945,714

REFLECTOR FOR PHOTOELECTRONIC EQUIPMENT

Arthur A. W. Walter, Denzlingen, Germany, assignor to Erwin Sick Optik-Electronik, Waldkirch, Germany

Filed Mar. 1, 1974, Ser. No. 447,235
Claims priority, application Germany, Mar. 27, 1973, 2315261
Int. Cl.² G02B 5/124
U.S. Cl. 350—103 14 Claims



1. A reflector apparatus for use with photoelectronic equipment, said apparatus comprising:

a. a housing defining an opening in one side thereof and having a flanged portion about at least a portion of its periphery;

b. at least one reflective element positioned in said housing and having a reflective surface disposed toward said opening;

c. a transparent member positionable over said opening;

d. a relatively soft resilient sealing member interposed between said housing and said transparent member and being peripherally disposed with respect to said opening, and

e. at least one substantially U-shaped spring clip separate from said sealing member and engageable for extending around said flanged portion of said housing, said transparent member and said sealing member for demountably compressing said transparent member and said sealing member against said housing to form a sealable unit.

3,945,715

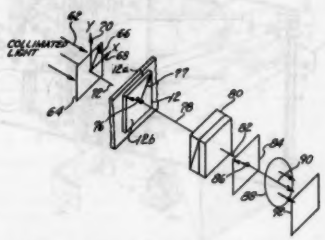
ELECTRO-OPTICAL BIREFRINGENCE DEVICE EMPLOYING EDGE EFFECT

Marvin D. Drake, Palm Bay, Fla., assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed Apr. 15, 1974, Ser. No. 460,741
Int. Cl.² G02F 1/03
U.S. Cl. 350—150 4 Claims

1. An electro-optical system for storing and reading data comprising an electro-optical birefringence device for use on a light path including a crystal having two major surfaces adapted to be disposed transversely to the light path, first and second conductive electrodes configured on portions of the

first and second major surfaces respectively, a first volumetric portion of said crystal defined by the configurations of said electrodes and having electrodes on both of said surfaces, a second volumetric portion of said crystal having electrodes on fewer than both of said surfaces and forming a boundary with said first portion, and edge region of said crystal at and near said boundary, electrical energizing means connected with said electrodes for momentarilly and selectively producing a relatively high and a relatively low electric field transverse to said surfaces and principally in said first portion such that said high field causes a strain at said edge region that cooperates with said electric field to render said edge region birefringent, said crystal comprises a type of material exhibiting ferro-electric remanence, and wherein said relatively high electric field is a remanent ferro-electric field remaining in said crystal after said electrical energizing means has ceased to energize said first portion, optical means for passing light along said path and sensitive to the level of birefringence of said edge region, said optical means including light source means for directing linearly polarized light to said crystal from the same side as said first surface while said crystal is strained only at said edge region by said remanent ferro-electric field, and light analyzer means on said light path for receiving output light that has passed through said crystal, the polarization vector of said analyzer being oriented to transmit an elliptical component of polarization of said output light from said edge regions, which is produced only when said electric field is high.

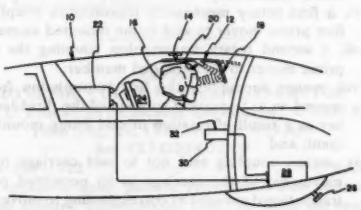


3,945,716

ROTATABLE HEAD UP DISPLAY WITH COORDINATE REVERSAL CORRECTIVES

Floyd A. Kinder, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 20, 1974, Ser. No. 534,617
Int. Cl.² G02B 27/14
U.S. Cl. 350—174 **8 Claims**



1. In a visual aid for target acquisition and weapon delivery by an operator from a vehicle, the combination comprising:

a control arm pivotally mounted to the vehicle above and approximately on the same axis as the head of the operator of the vehicle;

optical viewing means depending from said arm into the normal field of view of the operator;

image projection means mounted on said arm in a position to project images onto said optical means;

movable tracking means on said vehicle for acquiring and tracking a target and trasmitting images to said projection means; and

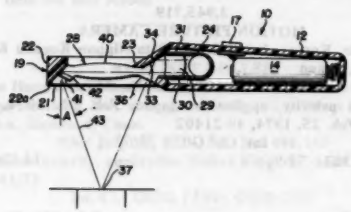
means automatically positioning said control arm in response to and in coordination with movement of said tracking means to present said projection means substantially along the azimuth of said target.

3,945,717

ILLUMINATING MAGNIFYING LENS STRUCTURE

Francis E. Ryder, Barrington, and Theodore H. Mueller, Cary, both of Ill., assignors to Ryder International Corporation, Barrington, Ill.

Filed Oct. 10, 1974, Ser. No. 513,730
Int. Cl.² G02B 25/02
U.S. Cl. 350—237 **6 Claims**



1. In an illuminated magnifying lens structure, the combination comprising: a housing, a light source secured within said housing and adapted to be selectively energized and de-energized, a magnifying lens element secured to said housing, said magnifying lens element having a predetermined focal length to magnify objects at an object point of predetermined distance from said lens, the improvement wherein said magnifying lens structure includes a central magnifying portion, and integrally formed prismatic end portions on opposite sides of said magnifying portion, a first one of said prismatic end portions being disposed adjacent said light source and including a light receiving section to gather light energy for transmission through said lens, said first prismatic portion further including an inclined reflective surface and a refractive surface disposed opposite said reflective surface, said refractive surface being angled to focus light energy on said object point, and said other second prismatic portion being disposed on the opposite side of said central magnifying portion and including a reflective surface and a refractive surface for diverting and focussing on said object point the light initially passing through said magnifying portion, whereby a substantial amount of the light energy emitted by said light source is focussed on said object point.

3,945,718

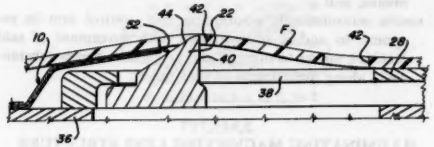
SYNC CONTACT SWITCH FOR MOVIE CAMERA

John D. Werner, 1168 S. Washington Way, Denver, Colo. 80210

Filed July 8, 1974, Ser. No. 486,384
Int. Cl.² G03B 31/04
U.S. Cl. 352—12 **8 Claims**

1. In combination, a movie camera and a switch adapted to be placed in the movie camera, said camera having a film compartment with a channel therein through which the film is intermittently advanced, an electrically conductive reciprocal pull-down claw protruding into the channel and adapted to cooperate with the film to advance the film through the channel, said switch being adapted to close once per frame of film

being advanced through the channel and including an insulated base member, said base member being positioned in the film compartment of the camera in adjacent relationship with



said channel, active and grounding contact means on said base member for separately grounding the switch and engaging said pull-down claw of the camera with each reciprocating cycle of said pull-down claw.

3,945,719

MOTION PICTURE CAMERA

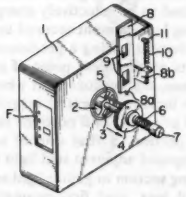
Yozo Iida, Komae, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Feb. 21, 1975, Ser. No. 551,670

Claims priority, application Japan, Feb. 25, 1974, 49-21401; Feb. 25, 1974, 49-21402

Int. Cl.² G03B *23/02*

U.S. Cl. 352—72 **14 Claims**



1. A motion picture camera which permits selective use of a magazine A of the type having an unreleasable reverse-preventing means provided on a take-up shaft for taking up thereon exposed film and a magazine B of the type having an extraneously releasable reverse-preventing means provided on a take-up shaft and which has a take-up gear rotatable in response to a motor and a member secured to said gear for rotating said take-up shaft with rotation of said gear, said camera comprising:

detector means displaceable to a first position upon insertion of said magazine A and to a second position upon insertion of said magazine B to identify the magazine inserted, said take-up gear being integrally formed with said detector means for displacement in the axial direction thereof;

control means manually operable for displacement from a first position for permitting rotation of said take-up gear to a second position for disabling said take-up gear from rotating when said detector means is in its first position; and

means for releasing the reverse-preventing means of said magazine B when said magazine B is inserted.

3,945,720

MAP DISPLAYS

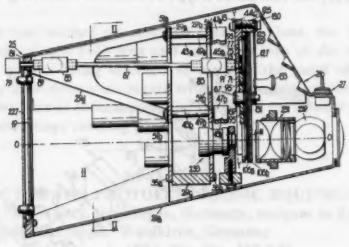
Stafford Malcolm Ellis, Maidstone, England, assignor to Elliott Brothers (London) Limited, England

Filed Apr. 29, 1974, Ser. No. 464,839

Claims priority, application United Kingdom, Apr. 30, 1973, 20397/73

Int. Cl.² G03B *21/00, 21/10*

U.S. Cl. 353—12 **6 Claims**



1. A topographical map display device comprising

A. a frame;

B. a carriage carrying a topographical map in miniaturized form;

C. a mechanism coupling the carriage to the frame and permitting translational planar movement only of the carriage with respect to the frame;

D. a display surface;

E. an optical projection system operable to project in magnified form onto the display surface the image of an area of the map;

F. actuator means comprising

i. an element mounted on the frame for rotation about a first axis passing through a point fixed with respect to the frame;

ii. a threaded member mounted on said element for rotation about a second axis passing through said fixed point in a direction perpendicular to said first axis;

iii. a nut engaged with said threaded member so as to move angularly around said first axis on rotation of said element and to move along said second axis on rotation of said threaded member:

iv. a first prime mover controlled by signals representing bearing of a vehicle with respect to a ground-based transmitter;

v. a second prime mover controlled by signals representing range of the vehicle with respect to the ground-based transmitter;

vi. a first rotary mechanical transmission coupling the first prime mover to said frame mounted element;

vii. a second rotary transmission coupling the second prime mover to the threaded member;

viii. means decoupling the first transmission from the second so as to prevent rotation of the threaded member as a result of rotation of said frame mounted element; and

ix. means coupling said nut to said carriage to cause movement of the carriage in its permitted plane of translational movement corresponding to movement of the nut in a plane perpendicular to said first axis and parallel to said second axis so that the area of the map which is projected to form an image on the display surface changes with the vehicle movement; and

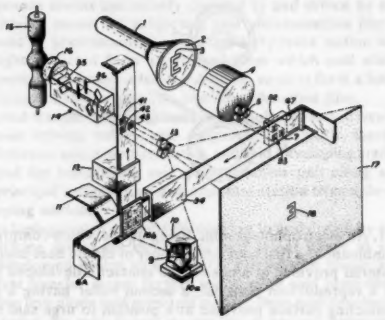
G. a predetermined datum on the display surface which represents in relation to said image the geographical position of the vehicle.

3,945,721

GROUP DISPLAY SYSTEM

Donald G. Corcoran, Montvale, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Nov. 22, 1974, Ser. No. 526,347
Int. Cl.² G03B 21/14, 23/12, 27/17
U.S. Cl. 353—84 12 Claims



1. A projecting system for group data display comprising:
a luminous data source
means for intensifying the light energy of said data disposed optically proximate said source;
means for recording said data disposed optically proximate said means for intensifying; and
means for projecting said data upon a viewing screen, said means for projecting and said viewing screen being disposed optically proximate said means for recording;
said means for recording said data comprising:
a first light sensitive film proximate said means for intensifying for receiving said light energy from said means for intensifying and exposing said film;
first dry chemical means for processing said first film in order to develop said data on said film;
optical means for transferring the data from said first film onto a second light sensitive film; and
second dry chemical means for processing said second film in order to print said data on said second film;
said means for projecting said data and said viewing screen being optically proximate said second film after said data has been printed thereon.

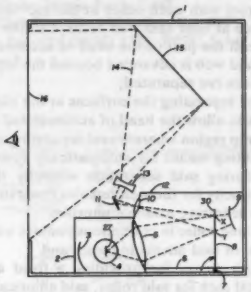
3,945,722

DYNAMIC COLOR PATTERN GENERATOR

Melvin L. Prueitt, 161 Cascabel, Los Alamos, N. Mex. 87544

Filed Aug. 20, 1974, Ser. No. 499,057
Int. Cl.² G03B 21/00
U.S. Cl. 353—122 6 Claims

1. A dynamic color pattern generator which continually produces colored light patterns reflected from the two surfaces of a thin liquid film and displayed upon a screen comprising:
a. a light source means positioned within a first container, and directed at the thin liquid film,
b. means for continually forming the thin liquid film supported by surface tension within a loop-like structure, and enclosed in a second air-sealed container positioned inside first container, and
c. means for projecting the colored light patterns which are



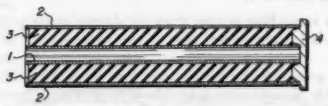
reflected from the said two surfaces of the thin liquid film onto the said screen.

3,945,723

RESILIENT ROLLER

John Hayward Cook, Sawbridgeworth, and John Wales, Bishops Stortford, both of England, assignors to Xerox Corporation, Stamford, Conn.

Filed July 19, 1974, Ser. No. 490,145
Claims priority, application United Kingdom, Sept. 7, 1973, 42181/73
Int. Cl.² G03G 15/00; G03D 5/00
U.S. Cl. 355—3 R 13 Claims



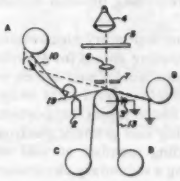
1. A cylindrical member which is sufficiently resilient across its functional surface to maintain substantial line of axial tangency with a rigid cooperating surface, said roller comprising a rigid central member, a flexible sleeve, and an elastic substance positioned between the flexible sleeve and the rigid member, in which said elastic substance is axially compressed.

3,945,724

VELOCITY COMPENSATION FOR BEAD BYPASS

Earl V. Jackson, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 4, 1974, Ser. No. 476,187
Int. Cl.² G03G 15/00
U.S. Cl. 355—3 P 10 Claims



1. Apparatus for removing a bead of accumulated suspension comprising particles in a liquid from the entrance to the nip of a web surface and another surface, successive portions

of which move into contact with each other at the nip, comprising:

a. means for advancing successive portions of said surfaces into contact with each other at the nip including means to advance at least said web relative to the nip region so that at least the part of the bead of accumulated suspension on said web is advanced beyond the nip region when the surfaces are separated;

b. means for separating the surfaces at the nip to a spacing sufficient to allow the bead of accumulated suspension to pass the nip region wherein said separating means include compensating means for automatically compensating for motion during said separation whereby the advancing rate of velocity for the web remains constant and wherein said compensating means comprises:

i. at least one roller in continuous contact with the outside surface of said advancing web, and

ii. tracking means for providing a fixed approximately elliptical path for said roller, said elliptical path permitting said roller during separation to track in a path which always causes reduction of the wrap angle formed by said advancing web in contact with the other surface to cause separation of the two surfaces without changing the advancing velocity rate of the web.

3,945,725

FLAT SCREEN ELECTROSTATIC COPIER

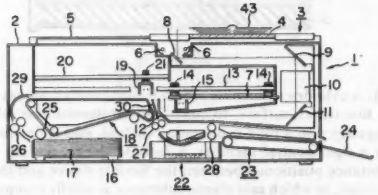
Inao Moriyama, Ebina; Keiji Tanaka, Kawasaki; Yujiro Ando, Yokohama, and Katsunobu Ohara, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 26, 1974, Ser. No. 483,354

Claims priority, application Japan, June 29, 1973, 48-74101; July 24, 1973, 48-94968

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 R **20 Claims**



1. A copying apparatus, for copying an image of an original onto a recording member, comprising:

a photosensitive screen having a plurality of apertures;

means for reciprocally moving said screen from a start position to a recording position within a predetermined plane;

means for forming a primary electrostatic latent image on said screen including means for applying a light image of an original to one side of said screen while said screen is moving in said plane, said light image applying means having a light image projecting portion;

means for applying said primary electrostatic latent image to said recording member at said recording position, thereby forming a secondary electrostatic latent image on said recording member while said screen remains stationary;

means for visualizing said secondary electrostatic latent image on said recording member; and

means for fixing said visualized image on said recording member.

3,945,726

ELECTROPHOTOGRAPHIC FIXING DEVICE

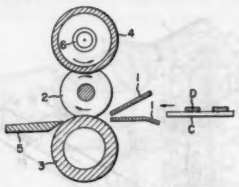
Yoshio Ito, Yokohama; Toru Takahashi, Tokyo; Takayuki Ishihara, Tokyo; Hiroo Kobayashi, Tokyo, and Atsushi Matsuoka, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 16, 1974, Ser. No. 506,087

Claims priority, application Japan, Sept. 17, 1973, 48-104743

Int. Cl.² G03G *15/20*

U.S. Cl. 355—3 R **14 Claims**



1. An electrophotographic fixing device which comprises in combination: a first heat fusing roller of elastic heat-insulating material provided at a position to contact a developed image on a reproduction material; a second roller having a press-contacting surface provided at a position to urge said reproduction material against said heat fusing roller, wherein said press-contacting roller deforms the surface of said heat fusing roller; and a heating roller provided at a position to heat the peripheral surface of said heat fusing roller, wherein said heating roller and said press-contacting roller are spaced apart at a distance wheich is less than the diameter of said heat fusing roller, and said heat fusing roller is mounted for radial movement between a first position away from both said heating roller and said press-contacting roller, and a second position wherein it is interposed between said heating roller and said press-contacting roller.

3,945,727

PHOTOGRAPHIC PRINTING AND PROCESSING APPARATUS

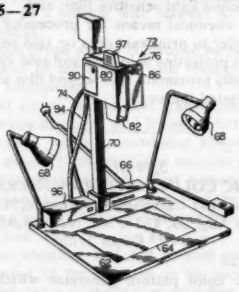
Yasutaka Nakajima, Neyagawa; Toshiharu Sasaki, Kawanishi, and Noboru Katakabe, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd. - Wireless Research Laboratory, Osaka, Japan

Filed Aug. 13, 1974, Ser. No. 497,132

Claims priority, application Japan, Aug. 14, 1973, 48-91129

Int. Cl.² G03B *27/32*, *27/52*

U.S. Cl. 355—27 **9 Claims**



1. A photographic apparatus for producing a visible permanent image on a photosensitive film in a photosensitive unit which comprises a film mount and said photosensitive film mounted on said film mount, said photographic apparatus including:

a first member having a supplying station, an exposure station, a developing station and a fixing station provided

along a path on a principal surface thereof, said photosensitive unit being supplied to said supplying station;

driving means;

first transfer means operatively coupled to and driven by said driving means and reciprocally movable thereby in a plane parallel to and spaced from said principal surface of said first member at a distance slightly larger than the thickness of said photosensitive unit for transferring said photosensitive unit along said principal surface from said supplying stataion to said exposure station by a first movement thereof;

exposure means operatively coupled to and driven by said driving means for subjecting said photosensitive film of said of photosensitive unit at said exposure station to a light reflected from an original from which said visible permanent image is to be produced, so as to form a latent image of said original on said photosensitive film;

second transfer means operatively coupled to and driven by said driving means and reciprocally movable thereby between said exposure station and said developing station and for transferring said photosensitive unit along said principal surface from said exposure station to said developing station;

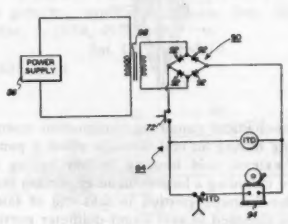
developing means operatively coupled to and driven by said driving means for developing said latent image at said developing station so as to form a developed image, said first transfer means further transferring said photosensitive unit along said principal surface from said developing station to said fixing station by a second movement thereof; and fixing means operatively coupled to and driven by said driving means for fixing said developed image at said fixing station so as to form said visible permanent image.

3,945,728

ALARM FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

Melvin G. Crandell, Walworth, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 8, 1974, Ser. No. 522,000
Int. Cl.² G03B 27/62
U.S. Cl. 355—75 **8 Claims**



1. An apparatus for housing an original document, including:

means for supporting the original document;

means for detecting the failure to remove the original document from said supporting means after the elapse of a preselected duration of time;

a cover member operatively associated with said supporting means and being movable from an opened position permitting the orignal document to be disposed on said supporting means to a closed position securing releasably the original document on said supporting means; and

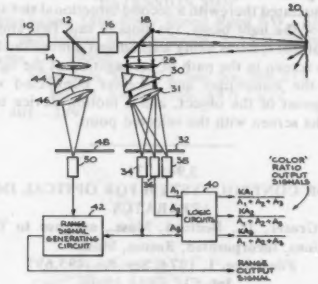
means for illuminating the original document disposed upon said supporting means.

3,945,729

COMBINED RANGING AND COLOR SENSOR

Charles A. Rosen, Atherton, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed Dec. 30, 1974, Ser. No. 537,674
Int. Cl.² G01C 3/08; B07C 5/342
U.S. Cl. 356—5 **5 Claims**



1. A method of producing signals representative of the range and color of each spot in a scene viewed from a predetermined location comprising

illuminating a scene with light from a multimode laser light source to cause said scene to emit scattered light,

successively collecting the scattered light from each spot in said scene and separating it into a plurality of different color light beams,

converting each of said plurality of different color light beams from each spot into a representative electrical signal,

generating range signals for each spot in said scene responsive to the phase of one of said representative electrical signals,

establishing for each spot relative amplitude ratios of said electrical signals to provide color ratio signals, and

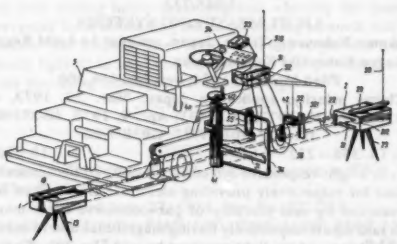
utilizing said range and color ratio signals.

3,945,730

ARRANGEMENT FOR MEASURING, CHECKING AND CONTROL OF THE POSITION OF CHOSEN POINTS OF OBJECTS WITH RESPECT TO AN OPTICAL AIMING LINE

Tomislav Simecek, and Emil Sipek, both of Prague, Czechoslovakia, assignors to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia

Filed Aug. 13, 1973, Ser. No. 387,671
Int. Cl.² G01B 11/00
U.S. Cl. 356—167 **3 Claims**



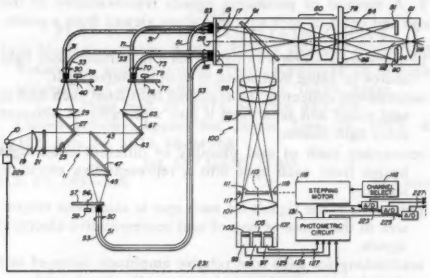
1. Arrangement for the measurement, checking and control of the position of a selected point of an object with respect to an optical aiming line extending between the center of an

optical system of a transmitter of a measuring beam of light and the center of an optical system of a receiver which is selectively sensitive to the wavelength and modulation of the light beam, the transmitter comprising a semiconductor light emitting diode having associated therewith a first directional slot system associated with the diode and disposed in the path of the light beam emitted thereby, the slot in said first system having a length substantially larger than its width, the receiver comprising small area semiconductor photodetector means having associated therewith a second directional slot system in the path of the light beam, the slots in said first and second directional slot systems being aligned and dimensionally coextensive, a screen in the path of propagation of the light beam between the transmitter and receiver connected with the selected point of the object, and a motion device interconnecting the screen with the selected point.

3,945,731
COLOR CONTROL SYSTEM FOR OPTICAL IMAGE APPARATUS

Michael Graser, Jr., Bedford, Mass., assignor to Technical Operations, Incorporated, Boston, Mass.

Filed Aug. 1, 1974, Ser. No. 493,697
Int. Cl.² G01J 3/50
U.S. Cl. 356—178 **12 Claims**



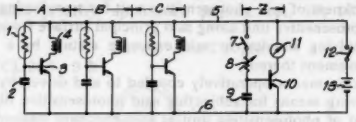
1. In an optical apparatus employing a plurality of individual light channels each having one or more light sources, means to supervise said sources comprising means to sample light from each source, means to present the samples of light from all said sources in unison in a spatial array in a prescribed location, spatial filter means in said location operable to pass light from a selected one of said channels while blocking light from the remaining ones of said channels, photometric means disposed to receive light passed by said filter means, means to operate said filter means to pass light from a selected one of said channels to said photometric means, and means to provide from each sample a signal that is related to the intensity of said sample.

3,945,732
LIGHT-MEASURING SYSTEMS

Tsukumo Nobusawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Mar. 29, 1974, Ser. No. 456,380
Claims priority, application Japan, Mar. 30, 1973, 48-35830; Mar. 30, 1973, 48-35831; Apr. 9, 1973, 48-39590
Int. Cl.² G01J 1/42; G03B 7/08
U.S. Cl. 356—222 **18 Claims**

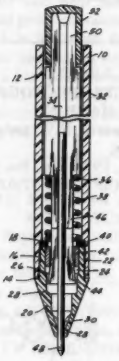
1. In a light-responsive system, a plurality of photosensitive means for respectively providing electrical inputs when light is received by said plurality of photosensitive input means, with said inputs respectively having magnitudes determined by the brightness of the light received by said plurality of photosensitive input means, support means supporting said plurality of photosensitive input means respectively in positions for receiving light from different parts of a scene so that when the scene has a condition of non-uniform brightness the magnitudes of said inputs will vary with a pair of said photosensitive input means respectively providing inputs of maximum and minimum magnitude, electrical output means for providing a given output, and a plurality of electrical circuit means respectively connected electrically with said plurality of photosensitive input means for respectively producing given signals in a sequence determined by said magnitudes and all connected electrically with said output means for providing at the latter an output determined by the signal produced by the electrical circuit means connected to at least one of said pair of photosensitive input means.



3,945,733
MECHANICAL PENCIL

Günter Edel, Fuerth, Germany, assignor to A.W. Faber-Castell, Nurnberg, Germany

Filed Apr. 15, 1974, Ser. No. 460,906
Claims priority, application Austria, Oct. 12, 1973, 8725/73
Int. Cl.² B43K 21/22
U.S. Cl. 401—94 **6 Claims**



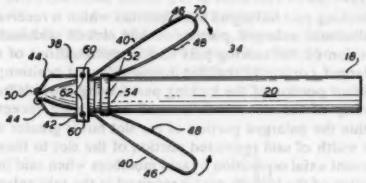
1. In a mechanical pencil, a combination comprising an outer housing having an end through which a pencil lead is adapted to extend, said housing further having a stepped internal bore including a larger-diameter portion remote from and a smaller-diameter portion in said end of said housing; collet means disposed in said larger-diameter portion of said bore and consisting of two mating elongated half shells each consisting of high-strength resilient plastic material, each of said half shells having an end portion adjacent to said end of said housing and flaring outwardly toward said end, said end portions of said half shells being free of longitudinally extending slots, being separated from each other by a gap and together constituting a substantially conical end portion of said collet means; a non-deformable annulus mounted in said housing and having an internal diameter smaller than the maximum transverse dimensions of said conical end portion of said collet means, said conical end portion extending through said annulus; and compression spring means surrounding said half shells and biasing said conical end portion of said collet means in a direction away from said end of said housing and into engagement with the inner surface of said annulus, each of said outwardly flaring end portions having diametral por-

tions spaced apart from each other by a distance which is less than said internal diameter of said annulus to allow said outwardly flaring end portions to slip through said annulus one after the other in a direction toward said end of said housing, when said half shells are axially displaced with respect to each other.

3,945,734
SELF CAPPING LIQUID APPLICATORS

Richard C. Woodbridge, 56 William St., Princeton, N.J. 08540

Filed May 19, 1975, Ser. No. 578,980
Int. Cl.² B43K *5/00, 5/16*
U.S. Cl. 401—198 **17 Claims**



1. A capping apparatus for capping and uncapping a liquid applicatior having a wick-like tip and a liquid containing reservoir body, said apparatus comprising:

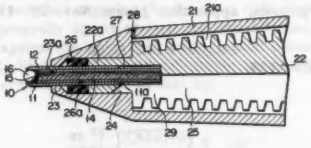
a hollow, flexible, capping sleeve means attached at one end to said applicator body; and,

a retracting means also connected to said sleeve and to said applicator body for selectively retracting and spreading said sleeve in response to manual pressure and for automatically returning said sleeve to a capping position in the absence of manual pressure.

3,945,735
SOCKET FOR HOLDING THE WRITING BALL OF A BALL POINT PEN

Koso Nakashiki; Akira Yoshimoto, and Kazuhiko Osaki, all of Kure, Japan, assignors to The Sailor Pen Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1974, Ser. No. 537,138
Claims priority, application Japan, Jan. 30, 1974, 49-11983; Mar. 5, 1974, 49-25240
Int. Cl. B43k *7/10*
U.S. Cl. 401—216 **25 Claims**



1. A socket for holding the writing ball of a ball point pen comprising:

an outer tubular member having a substantially circular cross section;

an inner tubular member of substantially elliptic cross section which is inserted into the outer tubular member, such that one end of said inner tubular member is positioned more inward of the socket than the corresponding end of said outer tubular member;

ink conducting chambers of substantially crescent cross section defined between the inner peripheral wall of the outer tubular member and the outer peripheral wall of the inner tubular member and extending along the full length of said inner tubular member;

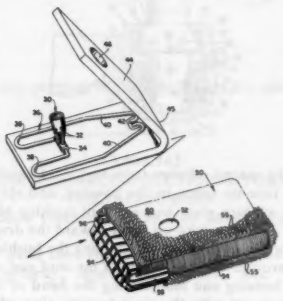
a ball-bearing rod inserted into the inner tubular member; and

a writing ball rotatably supported by one end of the outer tubular member and that end of the ball-bearing rod which is disposed adjacent to said one end of the outer tubular member.

3,945,736
EXTENSION MOP

Max Rittenbaum, 1886 River Forest Road NW., Atlanta, Ga. 30327, and Jeffrey A. Rittenbaum, 5563 Woodbury Circle, Marietta, Ga. 30060

Filed Sept. 23, 1974, Ser. No. 508,272
Int. Cl. A46b *11/06;* **A47l** *13/22*
U.S. Cl. 401—289 **2 Claims**



1. In an extension mop: an extension handle having a fitting attached to one end thereof, an open wire frame having said wire members substantially in the same plane and said side wire members having said fitting movably attached thereto near the middle of the frame, a resilient absorbent pad having substantially flat portions covering both the top and the bottom of said frame and said pad having a hole in the top portion through which projects said fitting and with the handle extending therefrom, a cleaning mitt constructed to form a three-dimensional arrangement having an open mouth and said mitt being made from a pile material comprising yarn filaments arranged in rows, said mitt mouth being closable by means of a foldable flap which is folded around the bottom to open the mouth and upon the top of the mitt around the resilient absorbent pad which is compressed therein to close the mouth and thereby completely cover the absorbent pad, said flap being attached on the sides of said mitt and folding around the edges and over the top of the mitt thereby securing the mitt in place with the pad compressed therein to hold said mitt in place, and said mitt having a hole therein just large enough to accommodate the handle at the fitting, whereby the mitt will not normally dislodge from the position covering the absorbent material even during heavy scrubbing and whereby the frame is prevented from contacting the surface being cleaned, and said resilient pad is compressed within said flap to provide a sufficiently tight fit to hold said mitt in place and prevent the mitt from becoming dislodged during cleaning.

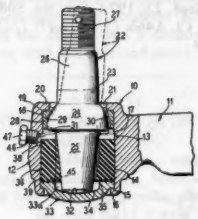
3,945,737
PIVOT JOINT

Edward J. Herbenar, Detroit, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Nov. 27, 1974, Ser. No. 527,755
Int. Cl.² B25G *3/00;* **F16D** *1/00;* **F16G** *11/00;* **F16C** *11/00*
U.S. Cl. 403—27 **9 Claims**

1. A pivot joint which comprises a housing having a bore therethrough with a reduced opening at one end thereof, a closure plate closing the opposite end of the bore having a recess surrounded by an upstanding abutment wall, a stud

having a shank portion projecting freely through the reduced opening of the housing, a half ball head portion in the housing adjacent the reduced opening, a tapered pin portion converging from the central portion of the head into the recess of the closure plate and a rounded bottom end portion on the pin riding on the bottom of the recess of the closure plate, a rigid bearing ring in said housing bottomed at the reduced opening thereof having a ball seat tiltably and rotatably receiving the half ball head portion of the stud, an axially split resilient bushing in the housing surrounding the tapered pin portion of the stud in mated engagement with the pin and housing and



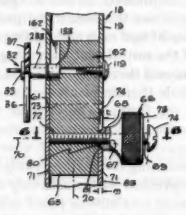
terminating in spaced relation from said rigid bearing to provide a wear take-up space in the housing, and spring means between the closure plate and resilient bushing biasing said bushing into said wear take-up space toward the divergent end of the pin portion of the stud maintaining the bushing in bearing contact around the pin portion of the stud and around the bore of the housing and maintaining the head of the stud in seated engagement with the rigid bearing ring whereby the stud can tilt on said seat on a fixed center through an angle limited by the abutment wall of the recess engaging the pin portion of the stud and will rotate on the seat and in the bushing on a fixed center.

3,945,738

DETACHABLE CONNECTIONS FOR CAMERAS OR THE LIKE

Gerhard I. W. Bahnsen, Box 1297, South Lake Tahoe, Calif. 95705

Filed Mar. 22, 1974, Ser. No. 452,239
Int. Cl.² F16D 7/10
U.S. Cl. 403—109 **9 Claims**



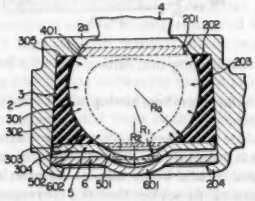
1. A quick change connection comprising:
two members having two ends respectively to be connected detachably together and movable relative to one another essentially along a predetermined axis between a separated condition and an axially interfitting connected condition;
a locking part mounted at a side of a first of said members for movement relative thereto essentially transversely of said axis and toward and away from a side surface of said first member and between locking and released positions;
a structure extending generally transversely of said axis between said locking part and said first member and mounting said locking part for threaded adjusting movement between said locking and released positions;
the second of said members having a wall which is receivable alongside said side surface of said first member and contains a slot into which said structure is movable through an open end of the slot upon relative movement of the members axially together;
said slot having an enlarged portion spaced axially inwardly from said open end of the slot and having a more restricted reduced width portion axially intermediate said open end and said enlarged portion;
said enlarged portion of said slot extending entirely through the thickness of said wall and having a width transversely of the slot which, through said entire thickness, is greater than the minimum width of said restricted portion of the slot;
said locking part having an inner portion which is receivable within said enlarged portion of said slot in said locking position of the locking part and is retracted out of said enlarged portion of the slot in said released position;
said inner portion of the locking part having a width transversely of the slot which is small enough for reception within the enlarged portion of the slot but is greater than the width of said restricted portion of the slot to thereby prevent axial separation of said members when said inner portion of the locking part is received in the said enlarged portion of the slot;
said restricted portion of the slot being wider than said structure which connects the locking part to said first member to enable movement of said structure along the slot between said open end and said enlarged portion when the locking part is in said released position;
said locking part having a shoulder outwardly beyond said inner portion thereof engageable with said wall about said enlarged portion of the slot in said locking position of the locking part to clamp said wall tightly against said side surface of said first member;
said inner portion of said locking part having a thickness inwardly beyond said shoulder and in the direction of ajdustment of said locking part which is less than the thickness of said wall in the same direction at said enlarged portion of the slot, to avoid contact of said inner portion of the locking part with said first member in a relation preventing said tight clamping engagement of said shoulder with said wall.

3,945,739

BALL JOINT

Michio Abe, Kasugai, Japan, assignor to Tokai TRW & Co., Ltd., Kasugai, Japan

Filed Nov. 25, 1974, Ser. No. 527,060
Claims priority, application Japan, Nov. 29, 1973, 48-133033
Int. Cl.² F16C 11/06
U.S. Cl. 403—138 **3 Claims**



1. A ball joint comprising a metallic housing having opposed first and second openings, a resilient bearing of polymer disposed in said housing, a ball stud having a metallic spherical member rotatably supported by said bearing, and resilient

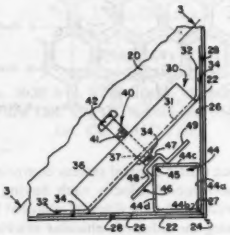
metallic closure means having a central depression and so secured as to close the second opening of said housing for applying pre-load to said bearing, said first opening having an annular surface slidably engaging one end of the spherical member, said depression having an annular surface slidably engaging the other end of the spherical member, the spherical member being elastically engaged and surrounded by said bearing between the annular surfaces whereby said annular surfaces support the spherical member when the ball joint is subjected to an external force in excess of the elastic limit of the bearing.

3,945,740

MEANS FOR DETACHABLY SECURING A PLURALITY OF SUPPORTING LEGS TO A HORIZONTAL MEMBER TO SUPPORT SAME

Raywood C. Weller, 17586 Vine St., Fontana, Calif. 92335

Filed Feb. 13, 1975, Ser. No. 549,534
Int. Cl.² A47B *13/00*
U.S. Cl. 403—217 7 Claims



1. Means for detachably securing a plurality of supporting legs which are generally square-shaped in cross section to a horizontal member to support same, said horizontal member having a plurality of downwardly depending corners, a diagonal connecting member positioned diagonally between adjacent sides of each said corner and secured to said adjacent sides, said diagonal connecting member having internally threaded means, an adjustable member supported by said diagonal connecting member, said adjustable member being externally threaded to engage said internally threaded means for adjusting said adjustable member with respect to said leg, a U-shaped member which is diagonally positioned and engaged by said adjustable member with the spaced sides of the U-shaped member engaging the inermost right-angled corner of said generally square-shaped leg and adapted to apply pressure against the leg to hold the leg in said corner between the said adjacent sides, said adjustable member when retracted permitting removal of said leg.

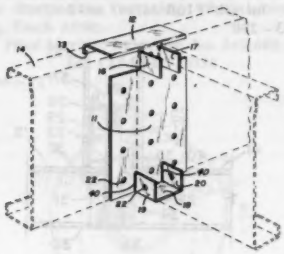
3,945,741

SELF-ALIGNING HANGER ATTACHMENT BRACKET FOR STRUCTURAL STEEL JOISTS

Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Jan. 6, 1975, Ser. No. 538,693
Int. Cl.² F16B *5/00*
U.S. Cl. 403—232 2 Claims

1. In a hanger for mounting hollow metal joists perpendicular to headers and the like, including a U-shaped top flange for hanging the hanger and a backplate suspended from the top flange with said backplate having side flanges extending outward therefrom and said side flanges being connected at the bottom edge to form a saddle for the joist, the improvement comprising: divided side flanges forming a top and bottom portion of the side flanges, and the spacing of the top portions of the side flanges closer together, a hollow joist resting on the saddle and attached to the side flanges and encompassing the



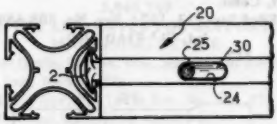
top of the top portions of the side flanges for additional support.

3,945,742

DEVICE FOR ASSEMBLING SECTIONAL FOR INSTANCE METALLIC BARS

Georges Julien Condevaux, 159, rue Blomet, Paris, France (75015)

Filed Dec. 18, 1974, Ser. No. 534,154
Claims priority, application France, Dec. 19, 1973, 73.45532
Int. Cl.² F16B *7/04*
U.S. Cl. 403—255 6 Claims



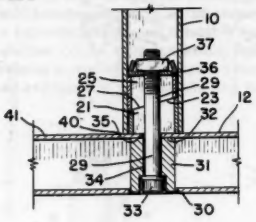
1. Device for endwise assembling a first sectional bar onto a second sectional bar extending at right angles thereto and having at least one flat face formed with a half-closed groove terminating at its open portion, at said flat face, in lips which restrict the size of the opening, said device comprising a rod portion and a tubular element which receives the rod portion, the latter being provided with an elongated head portion with parallel sides adapted to be inserted into the groove of the second sectional bar at any point thereof and then locked with the latter through a quarter turn rotation, said rod portion being provided with a high pitch helical groove extending over a quarter turn thereabout and terminating in a cup-like recess, a set screw screwed into a threaded hole in said tubular element and engaging said high pitch helical groove, said set screw projecting into the cup-like recess for holding said rod portion againsts motion in the tight clamping position, the position and shape of said cup-like recess ensuring that the lips of said groove are pressed against said head portion and the end of said first sectional bar, said element being positioned within the end of a hollow core of said first sectional bar, one face of this core being formed with an elongated slot the length of which is at least equal to the sum of the depth of said groove of said second sectional bar and of the length of said helical groove of said rod portion, said set screw extending through said slot whereby through displacement of said screw in said slot, said head portion may be fully retracted inside of said hollow core of said first sectional bar, said element further comprising means preventing its relative rotation with respect to at least one of said sectional bars.

3,945,743

TUBE FASTENING-JOINT ASSEMBLY

Victor C. Koch, 1480 Roswell St., Smyrna, Ga. 30080

Filed Oct. 15, 1974, Ser. No. 514,511
Int. Cl.² F16B 12/36; A47B 47/00
U.S. Cl. 403—290 9 Claims



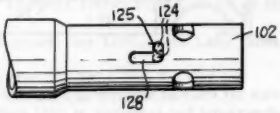
1. A tube fastening joint comprising at least one tubular member and one structural member connected together at an angle to each other, a pair of displaceable members cooperatively insertable into said tubular member each having abutting inclined planes, said displaceable members being slidably displaceable relative to each other for locking engagement within said tubular member, and means extending through said structural member for releasably and cooperatively retaining said pair of displaceable members in said tubular member whereby the tubular and structural members are securely fastened together upon relative displacement of said displaceable members by said releasable retaining means.

3,945,744

TELESCOPING STRUT CONSTRUCTION

Joseph R. Metz, Ridgefield, Conn., assignor to Norco, Inc., Ridgefield, Conn.

Filed Sept. 23, 1974, Ser. No. 508,689
Int. Cl.² F16D 1/00
U.S. Cl. 403—317 7 Claims



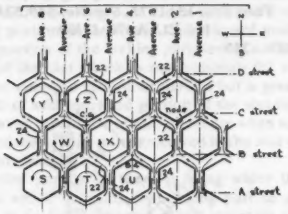
1. A strut construction comprising, in combination:
a. A pair of inner and outer strut members adapted to telescope one into the other to effect a composite strut of variable length,
b. multi-part, cooperable releasable means on said inner and outer members for locking the same in a predetermined, fixed position with respect to one another,
c. a collar member carried by the outer strut member for actuating said locking means, said collar member being movable longitudinally between an advanced, strut-locking position and a retracted, unlocking position,
d. means biasing said collar member to its advanced strut-locking position, and
e. cooperable means on said outer strut member and collar member for securing the latter, when in its advanced position, against longitudinal movement with respect to the outer strut member in response to turning of the collar member on said outer strut member,
f. said collar member biasing means automatically effecting turning of the collar member to its securing position when the collar member reaches said advanced position, and
g. the outer strut member having an end portion of reduced diameter, closely and slidably fitting the inner strut member, and having an annular shoulder defining said portion of reduced diameter,
h. said collar member biasing means comprising a coil spring surrounding and carried by said reduced diameter portion of the outer strut,
i. one end of said coil spring being secured in said annular shoulder,
j. the inner end of the inner strut member having an annular stop shoulder engageable with the annular shoulder of the outer strut member to orient the parts of said releasable locking means.

3,945,745

TRAFFIC FLOW CONTROL SYSTEMS

Amos I. T. Chang, 701 Harris Ave., Manhattan, Kans. 66502

Filed Aug. 5, 1974, Ser. No. 495,078
Int. Cl.² E01C 1/00
U.S. Cl. 404—1 9 Claims



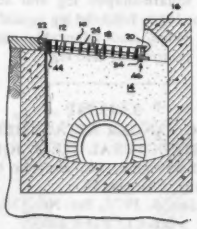
1. A street layout traffic control system comprising a plurality of identical honeycomb blocks each having six sides of identical length with the facing sides of adjacent blocks being parallel and defining the sides of vehicular arteries consisting of linear two-way north-south arteries branching into one-way streets oriented at approximately 300° and 60° heading for vehicles entering said streets in a northerly direction of movement at the northern ends of said north-south arteries and oriented at 240° and 120° heading for vehicles entering said streets in a southern direction of movement at the southern ends of said north-south arteries.

3,945,746

GRATING STRUCTURE FOR ROADWAY STORM DRAIN INLETS AND THE LIKE

Lee P. Bredbenner, Towson, Md., assignor to Maryland Grading and Fabricating Company, Inc., Baltimore, Md.

Filed Jan. 27, 1975, Ser. No. 544,653
Int. Cl.² E01F 5/00
U.S. Cl. 404—4 10 Claims



1. A traffic-bearing grating and adjustable locking structure to be removably secured in a rectangular stationary frame to cover a roadway opening or the like at traffic-bearing surface level, the frame having downwardly facing surface portions, comprising a generally rectangular grating panel including plural parallel longitudinal straight bearing bars including first and second outermost side bearing bars respectively adjacent

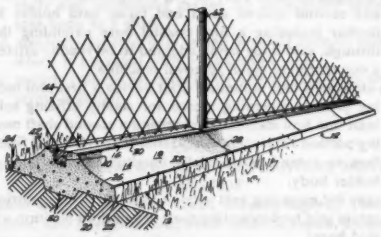
and confronting first and second opposite side frame members of said stationary frame, an anchoring shoulder formation fixed on said first side bearing bar having a rigid outwardly extending leg spaced at a location slightly below the lower edge of the first side bearing bar and projecting therefrom to interfit beneath a downwardly facing surface portion of said first frame member to prevent upward withdrawal of the adjacent grating portion therefrom when so interfitted, and an adjustable locking device carried by said second side bearing bar including an axially adjustable threaded stud extending through the second side bearing bar having threaded nut means for varying the axial position of the threaded stud and an angle shaped head on said stud defining a vertical contact face to confront and contact a vertical inside surface of the second frame member and shift the first end of the grating panel toward and away from said first frame member upon axial movement of the stud by the nut means, and said angle shaped head further defining a lower foot formation projecting outwardly from said contact face to extend beneath a downwardly facing surface portion of the second frame member upon axial outward adjustment of the stud by the nut means for locking the grating panel in the stationary frame.

3,945,747

EDGING GUIDE

Alcides Cruz, 3630 SW. 87th Court, Miami, Fla. 33165

Filed Oct. 29, 1974, Ser. No. 518,401
Int. Cl.² E01C *11/22*
U.S. Cl. 404—7 **6 Claims**



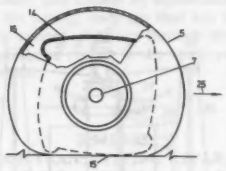
1. To guide a lawn mower an edging guide element to be positioned at the edge of a lawn comprising a rigid elongate slab having an upper surface, a lower surface to rest on the ground, similarly shaped and sized opposite end surfaces for abutting relation with a similar slab and a first and a second elongate face extending between the upper surface and the lower surface and end surfaces, said upper surface having a first upper portion extending between the end surfaces at a common predetermined height above the lower surface and a curved portion extending between the end surfaces and extending outwardly away from said upper portion and downwardly from said upper portion to said first face in a fair curve as seen in cross section defining a longitudinally extending edge at the juncture of the first face and said curved portion, said edge being at a common predetermined heighth above said lower surface to rest on the ground and defining a trimmed lawn height, said curved portion comprising a track for a lawn mower wheel.

3,945,748

COMPACTION BY SUPERIMPOSING IMPACT FORCES ON A PRELOADED AREA OF SOIL

Aubrey R. Berrangé, Pretoria, Transvaal, South Africa, assignor to Compaction Technology (Proprietary) Limited, Wynberg, South Africa

Filed May 13, 1974, Ser. No. 469,680
Int. Cl.² E01C *19/38*
U.S. Cl. 404—117 **4 Claims**



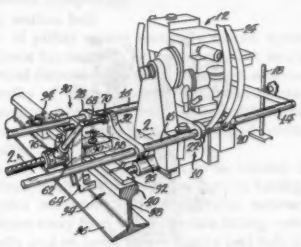
1. Soil compacting apparatus comprising means for applying a compacting force to an area of the soil to be compacted and means for applying an auxiliary force to an area of the soil enclosing the area to which the compacting force is applied, in which the auxiliary force applying means comprises a pneumatic tire and the compacting force applying means comprises a cylindrical compacting member within the tire, the cylindrical member being concentric with the tire and having a width which is smaller than the width of the track of the tire when in contact with the ground and the compacting member being arranged to contact the inner surface of the tire and thereby to impart a compacting force to the ground as the tire is moved across the ground.

3,945,749

CLAMPING APPARATUS FOR SUPPORTING A MACHINING DEVICE

William P. McIlrath, Racine, Wis., assignor to Racine Railroad Products, Inc., Racine, Wis.

Filed Apr. 24, 1975, Ser. No. 571,473
Int. Cl.² B23B *45/08*, *45/14*
U.S. Cl. 408—95 **7 Claims**

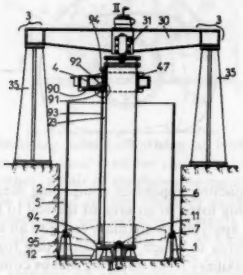


1. A clamping apparatus for supporting a rail drill having a base positioned to one side of a rail for support of the rail drill, clamp structure associated with said base for engagement with non-wear surfaces at opposite sides of the rail including a pair of similarly-shaped clamping blocks carried by said base at one side of the rail with each having means providing plural point contact with the rail including contact with the rail base, the rail web and a non-wearing surface of the rail head to accurately locate the base and rail drill relative to the rail, a clamping bar positioned at the opposite side of the rail from said clamping blocks, and means for drawing said clamping bar and clamping blocks toward each other to tightly clamp the rail therebetween with the rail drill accurately located relative to the rail.

3,945,750
BORING MACHINE FOR WORK PIECES OF LARGE DIAMETER

André Malot, LeCreusot, France, assignor to Creusot-Loire, Paris, France

Filed Mar. 5, 1974, Ser. No. 448,396
Claims priority, application France, Mar. 14, 1973, 73.09040
Int. Cl.² B23B *41/00, 47/18*
U.S. Cl. 408—117 9 Claims

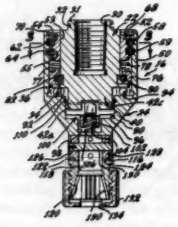


1. Boring machine comprising a work table, a boring bar, a tool carrier sliding along the bar for rotation with said bar, means for rotating said bar about its axis and means for positioning said tool carrier along said bar, said work table being horizontal and said boring bar being maintained in a vertical position by two centering devices, one of said device being located on said work table, and the other of said devices being mounted on a horizontal cross-piece of a gantry extending over and spaced from said table.

3,945,751
UNIVERSAL FLOATING TOOL HOLDER

Allan S. Johnson, 1400 Nottingham Road, Newport Beach, Calif. 92660

Filed Sept. 30, 1974, Ser. No. 510,356
Int. Cl.² B23G *3/06*
U.S. Cl. 408—127 3 Claims



1. A tool holder adapted to being carried by a machine and to hold a tool, comprising in combination a first body having means for attachment to a machine;

a second body carrying a tool chuck, the first body and the second body being axially aligned and having parts in telescoping relationship;

means for transmitting rotary drive from the first body to the second body;

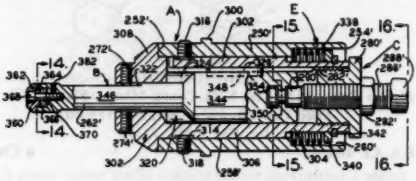
means interposed between the telescoping parts, providing for relative axial movement between the bodies and for limited lateral float of the second body relative to the first body where said interposed means between the telescoping parts includes resilient members having compressibility to allow for lateral float and where said interposed means comprises O-ring means positioned between the first body and the second body, whereby to allow the second body to float radially relative to the first body a limited amount; and

a bushing surrounding the first body having an annular groove, said second body having a juxtaposed annular groove, said O-ring means being held in said grooves and said bushing being axially movable relative to the first body.

3,945,752
CUTTING TOOL HOLDER

Gene Lee Bennett, North Madison, Ohio, assignor to Genio Tools, Inc., Mentor, Ohio

Division of Ser. No. 277,636, Aug. 3, 1972, Pat. No. 3,907,453. This application July 19, 1974, Ser. No. 490,045
Int. Cl.² B23B *51/00, 51/06*
U.S. Cl. 408—146 7 Claims



1. A cutting tool holder for maintaining at least one cutting tool member in a desired spaced relationship thereto as said at least one tool is selectively engaged with a workpiece for performing a cutting operation, said holder comprising:

an elongated holder body having a longitudinal axis and first and second spaced apart end faces, said holder body further including a first coaxial bore extending therethrough, said body being adapted to be readily affixed to a conventional metal removal machine;

an elongated tool mounting shaft having a first tool mounting portion including means for rigidly affixing said at least one tool member thereto and a second shaft mounting portion receivable in said first bore from said first end face to extend substantially longitudinally through said holder body;

means for engaging said second shaft mounting portion to retain said tool mounting shaft in a desired position within said bore;

means for selectively preventing rotational movement of at least said mounting shaft relative to said body;

means for selectively longitudinally moving said mounting shaft relative to said holder body and including an elongated adjustment member forming one part of said engaging means and threadedly extending through another part of said engaging means, said one part of said engaging means acting against said shaft mounting portion; and

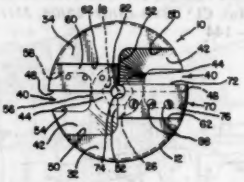
means received in said first bore over said shaft mounting portion for continuously biasing said shaft longitudinally of and inwardly toward said holder body, said biasing means comprising an elongated biasing sleeve closely slidably received over said mounting shaft and having a length approximately equal to the length of said body, said biasing sleeve having a first portion closely slidably received in said first bore adjacent said first end face, said biasing means further including means for maintaining said biasing sleeve in a desired position relative to said body, spring means received over said biasing sleeve in said first bore adjacent said biasing sleeve first portion, and a spring-retaining collar received over said biasing sleeve adjacent said second end face for maintaining said spring means in a compressed condition.

3,945,753

DRILL BIT DEVICE

John E. Byers, and Gary L. Byers, both of 2130 Choteau St., Helena, Mont. 59601

Filed July 29, 1974, Ser. No. 492,481
Int. Cl.² B23B 51/00
U.S. Cl. 408—201 8 Claims



1. A boring tool, comprising:

a. a generally circular drill bit body in the nature of a solid, shallow cylinder, said body having a back surface, a side edge surface and a working face, said working face being Occasionally a defined by a pair of opposed work surfaces in which at least flat planar portions thereof extend axially forwardly at an angle from a plane normal to the body axis and radially inwardly such that when extended intersect to define an intersection line passing through and normal to the body axis,

b. a pair of angling cut-away segments generally in opposed quadrants of the working face such that a segment extends through said body from the back surface to a working surface, said cut-away segments having cutting edges therein,

c. a shaft mounting portion located generally centrally of and extending rearwardly from the back surface of said body and containing means for detachably connecting said body to a shaft,

d. centrally located hole in the working face of said body which is provided with a lead screw, and

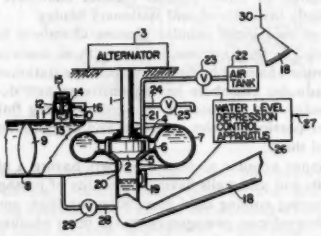
e. securing means for detachably holding said body and lead screw together.

3,945,754

HYDRAULIC MACHINES AND OPERATING METHOD THEREOF

Keiichi Hagiya; Mamoru Maki; Hiroshi Ogawa; Takeo Hachiya, and Kiyozo Ochiai, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 5, 1974, Ser. No. 494,901
Claims priority, application Japan, Aug. 6, 1973, 48-87466
Int. Cl.² F01D 17/00
U.S. Cl. 415—1 5 Claims



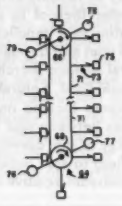
1. A method of operating a hydraulic machine having a draft tube leading to a runner within a chamber and a penstock with an inlet valve leading to a casing that is separated from the runner by a plurality of guide vanes, comprising the steps of: closing the inlet valve; closing the plurality of guide vanes; introducing a compressed gas into the runner chamber defined by the closed guide vanes to depress the water level in the runner chamber to a level below the lower portion of the runner while said inlet valve remains closed; substantially equalizing the water pressure in the casing between the closed guide vanes and the closed inlet valve with the gas pressure surrounding the runner within the runner chamber by feeding water from the draft tube into the casing without passing through the runner, and further by automatically venting, to the outside of the casing, only gas that has leaked into the casing from the runner chamber through the closed guide vanes; and rotating the runner in the compressed gas within the runner chamber.

3,945,755

TORQUE TRANSMITTING APPARATUS

Scipio S. Gentile, P.O. Box 1375, Inverness, Fla. 32650

Filed July 1, 1974, Ser. No. 484,369
Int. Cl.² F01D 23/00
U.S. Cl. 415—5 7 Claims



1. In an apparatus for transmitting torque to a load, the improvement comprising;

a long endless belt;

a pair of pulley means vertically spaced apart by a great distance for movably mounting said belt in a substantially vertical disposition to move it freely in a closed loop path;

a plurality of spaced apart arm devices connected to and extending from said belt and movable along said path alternatingly vertically upwardly and vertically downwardly;

a plurality of weights adapted to be carried by said arm devices, each one of said arm devices having one of said weights mounted thereon movable between an outer position away from said belt when falling vertically downwardly and an inner position near said belt when moving vertically upwardly, said weights and said arm devices being arranged in pairs, each one of the pairs of weights and arm devices providing a larger moment acting through said belt on at least one of said pulley means when falling vertically downwardly under the force of gravity and alternately providing a relatively smaller opposing moment when acting through said belt on at least one of said pulley means when being pulled vertically upwardly by said belt;

means coupled to at least one of said pulleys for connecting it drivingly to the load; and

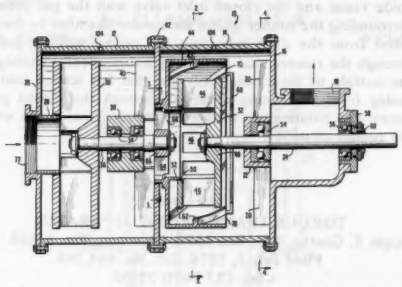
gravity-actuated means for moving said weights to their inner positions as they commence moving upwardly and for moving said weights to their outer positions as they commence falling downwardly.

3,945,756

CENTRIFUGAL PUMPING SYSTEM

Paul F. Ikenberry, 15943 Vera Court, Oak Forest, Ill. 60452

Filed Nov. 14, 1973, Ser. No. 415,509
Int. Cl.[2] F04D 13/04, 17/08
U.S. Cl. 415—66 8 Claims



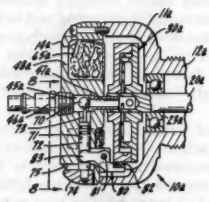
1. A system for pumping fluids comprising, a housing having a central inlet and a central outlet, an impeller mounted for rotation in said housing, said impeller having a peripheral surface and a plurality of radially extending slots therein extending from the center thereof to said peripheral surface, power means for rotating said impeller whereby the fluids are drawn in through said inlet and through said radially extending slots to said peripheral surface thereby imparting curvilinear and radial motion to said fluid, a plurality of radially extending fluid slowing guide vanes located on said housing near the fluid outlet, and means between said impeller and said vanes for retrieving the energy of said curvilinear motion, said radial motion forcing said fluid to said outlet, and said outlet being disposed axially downstream relative to said impeller.

3,945,757

TURBINE TYPE AIR MOTOR

Joseph R. Cummens, Elmhurst, Ill., assignor to Onsrud Machine Works, Inc., Niles, Ill.

Filed Dec. 19, 1974, Ser. No. 534,360
Int. Cl.[2] B23B 45/04
U.S. Cl. 415—80 11 Claims



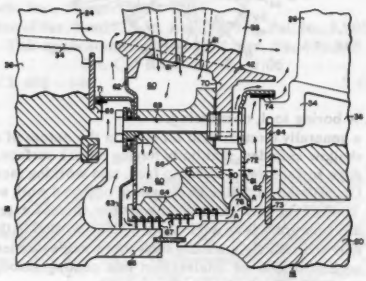
1. In a turbine type air motor, the combination comprising a housing, a rotor in the housing, means for feeding compressed air to the rotor, the rotor having an inlet and tangentially directed orifices for producing air jets for driving of the rotor, a rotor spindle mounted in the rotor for limited relative twisting movement and having means at its end for attachment of a rotary tool, means defining an adjustable throttle valve in the rotor interposed between the inlet and the orifices and responsive to the relative phase position of the spindle and rotor, and biasing means for biasing the spindle into a reference position with respect to the rotor in which the throttle valve is only partly open for throttling of air when the spindle is lightly loaded, with the retreating movement of the spindle against the biasing means when the spindle is more heavily loaded serving to open the throttle valve to produce a corresponding increase in driving torque.

3,945,758

COOLING SYSTEM FOR A GAS TURBINE

Richard M. Lee, Media, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 28, 1974, Ser. No. 447,180
Int. Cl.[2] F01D 13/02, 25/08, 25/12
U.S. Cl. 415—144 2 Claims



1. An axial flow elastic fluid machine having a multi-stage compressor and a turbine, said turbine comprising:

a stationary portion and a rotatable portion rotatable about a longitudinal axis;

said rotatable portion including a plurality of discs extending radially outwardly from said axis;

each of said discs having an annular array of radially extendiing blades disposed thereon;

said stationary portion including a plurality of annular arrays of radially extending stationary blades disposed adjacent said arrays of rotatable blades;

said stationary blades having at least one passageway extending generally radially therethrough;

said stationary portion also including a plurality of outer annular plenum chambers disposed radially outwardly of said stationary blades;

said rotating and stationary blades being disposed to provide a flow path for motive elastic fluid;

means for supplying cooling fluid to each of said outer annular plenum chambers from different stages of said compressor at a pressure slightly higher than the motive fluid in the fluid path adjacent the stationary blade;

a plurality of inner annular plenum chambers disposed radially inwardly of said stationary blades;

each of said inner annular plenum chambers being connected in fluid communication with an associated outer plenum chamber by passageways in the stationary blades;

said annular chambers having upstream and downstream passageways disposed to allow the cooling fluid to flow over portions of the upstream and downstream discs to cool them;

said inner annular plenum chambers having a plurality of walls and said walls having a plurality of passageways for directing cooling fluid upon adjacent discs; and

said downstream passageways in the inner plenum chamber being angularly disposed and arranged to direct the cooling air obliquely against the adjacent downstream discs;

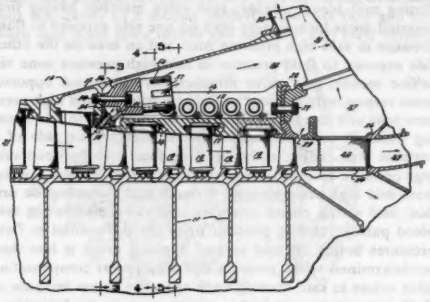
whereby cooling fluid has a pressure only slightly higher than the motive fluid and is efficiently supplied to cool the stationary blades and adjacent discs.

3,945,759

BLEED AIR MANIFOLD

Melvin Bobo, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Oct. 29, 1974, Ser. No. 518,269
Int. Cl.² F04D 27/02
U.S. Cl. 415—145 10 Claims



1. An improved turbomachine bleed-off arrangement of the type having a high pressure annular compartment, a low pressure compartment subject to circumferential variable pressure flow and a manifold to conduct the flow of air therebetween, wherein the improvement comprises:

an annular extending manifold having a plurality of circumferentially spaced passages formed therein for conducting the flow of air from the high pressure compartment to the low pressure compartment; and

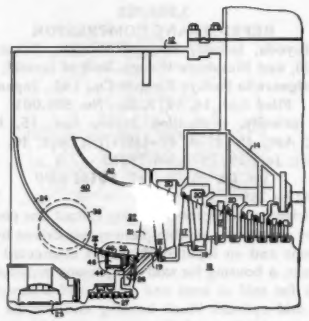
a check valve disposed in each of said passages, said valves having means for allowing the flow of air only from the high pressure compartment to the low pressure compartment.

3,945,760

OUTER CYLINDER FOR A LOW PRESSURE TURBINE APPARATUS

Klaus Miller, Douglaston, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 29, 1974, Ser. No. 518,910
Int. Cl.² F04D 29/52; F01D 1/02
U.S. Cl. 415—189 4 Claims



1. An outer cylinder for an axial flow turbine apparatus, said cylinder having a bearing inner cone portion and a gland support ring thereon, said cylinder surrounding a rotor having a rotating blade thereon, said cylinder comprising:

a sealed pocket structure formed in said bearing inner cone portion and said gland support ring, and,

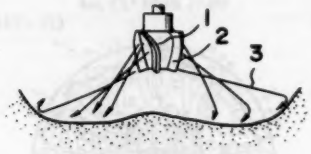
a removable member attached to the interior of said outer cylinder over said pocket, said removable member comprising a segment of said bearing inner cone, whereby the removal of said segment exposing said pocket within said cylinder adjacent to said blade in the direction of axial flow while said cylinder is surrounding said rotor, said pocket being of sufficient size to permit axial movement of a portion of said blade thereinto for the removal of the rotor blade.

3,945,761

FAN DISTURBING SAND AT THE BOTTOM OF A BODY OF WATER SO THAT IT MAY BE PUMPED UP EFFICIENTLY

Toshinobu Araoka, 1308 Orio, Yahata, Kitaky ushu, Fukuoka, Japan

Filed Sept. 2, 1971, Ser. No. 177,893
Int. Cl.² E02F 3/00
U.S. Cl. 416—188 1 Claim



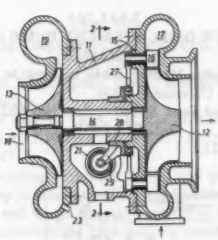
1. A fan for hydraulically disturbing sand at the bottom of a body of water, said fan comprising a central supporting member having a frusto-conical outer surface which is larger at its upper than its lower end and a plurality of vanes attached along their inner edges to said surface, said vanes being circumferentially distributed about said supporting member and extending for a substantially uniform distance from said frustoconical surface throughout their lengths, the lower part of each vane being substantially straight while its upper part is curved toward the direction of rotation of the fan.

3,945,762

HYDRAULIC GUIDE-WHEEL ADJUSTING MECHANISM

Werner Leicht, Stetten, Meersburg, Germany, assignor to Motoren-und Turbinen-Union Friedrichshafen GmbH, Germany

Filed July 1, 1974, Ser. No. 485,023
Claims priority, application Germany, July 2, 1973, 2333525
Int. Cl.² F04B 49/00
U.S. Cl. 417—18 19 Claims



1. A hydraulic adjusting mechanism for an exhaust gas turbo-supercharger of an internal combustion engine, the exhaust gas turbo-supercharger including a lubricating oil circulatory system, turbine means, compressor means, means for connecting said turbine means with said compressor means so as to rotate said turbine means and said compressor means in unision, guide wheel blade means provided on at least one of said turbine means and said compressor means for directing the flow of gases through the turbo-supercharger, housing

means interposed between said turbine means and said compressor means for housing said connecting means, and means for communicating the lubricating oil circulatory system with the adjusting mechanism, the adjusting mechanism comprising a control slide valve means for the control of the pressure of the lubricating oil system acting upon the adjusting mechanism and servo-piston means operatively connected with said guide wheel blade means for adjusting the position thereof, and means provided in said housing means for accommodating said control slide valve means and said servo-piston means.

3,945,763

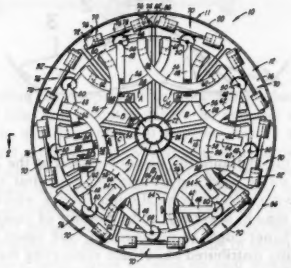
ROTATING LEVER-ACTUATED PUMPING APPARATUS

George E. Terhune, 519 Yates St., Gainesville, Tex. 76240

Filed Apr. 29, 1974, Ser. No. 464,973

Int. Cl.[2] F04B *23/04, 41/06*

U.S. Cl. 417—211 12 Claims



1. An apparatus for pumping a fluid, comprising:

a rotatable frame having an axle;

bearing means rotatingly supporting said axle generally horizontally for rotation;

a plurality of levers, each lever pivotally connected at fulcrum point on the frame removed from the axle and in close proximity to a proximal end of the lever;

a plurality of weights, one of the weights connected to each of the levers at a distal end of the respective lever, the weights positioned for variable displacement from the center of the frame as the levers pivot on the fulcrum points; and,

pump means engaged by the proximal ends of the levers, pumping said fluid.

3,945,764

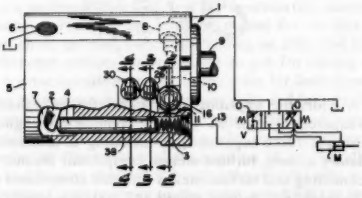
VARIABLE DISPLACEMENT PUMP CONTROL ASSEMBLY

Walter E. Marietta, Mentor, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Sept. 5, 1974, Ser. No. 503,249

Int. Cl.[2] F04B *1/26*

U.S. Cl. 417—212 14 Claims



1. Compensating means for a variable displacement pump of the type comprising a housing having pump means, high and low fluid pressure zones, and a fluid pressure actuated member having restricted communication with said high pressure zone and operatively engaged with said pump means to vary the displacement thereof; said compensating means comprising a valve member movable in said housing between positions opening and closing a bleed passage from said fluid pressure actuated member to said low pressure zone; spring means in said housing biasing said valve member to a position closing said bleed passage; said valve member having first opposed areas including an area on one side exposed to fluid pressure in said high pressure zone and an area on the other side exposed to fluid pressure in said high pressure zone via orifice means; said valve member having second opposed areas respectively exposed to fluid pressure in said high pressure zone and to a fluid pressure sensing passage in said housing which is communicated with the downstream side of a variable area orifice in the pressure feed path between said high pressure zone and a fluid motor actuated by fluid flowing from said high-pressure zone through said variable area orifice; said spring means retaining said valve member in said bleed passage closing position when the differential in fluid pressures acting on said second opposed areas is less than predetermined value; pressure and horsepower compensating pilot valves in said housing each operative, upon increase of fluid pressure in said high pressure zone to predetermined value, to open communication between said other side of said valve member and said low pressure zone for movement of said valve member by the then predominant fluid pressure acting on said one side of said valve member to open said bleed passage to bleed fluid pressure acting on said fluid pressure actuated member to said low pressure zone with consequent movement of said fluid pressure actuated member in pump displacement decreasing direction; each pilot valve including a spring biased pilot valve member with said horsepower compensating pilot valve having a spring follower engaged with a cam surface on said fluid pressure actuated member operative to increase the spring bias on the pilot valve member of said horsepower compensating pilot valve as said fluid pressure actuated member moves in a displacement decreasing direction; the aforesaid pressure differential, when exceeding such predetermined value, effecting movement of said valve member against said spring means to open said bleed passage to bleed said fluid pressure actuated member to said low pressure zone while said pilot valves are closed whereby said fluid pressure actuated member moves in a displacement decreasing direction.

3,945,765

REFRIGERANT COMPRESSOR

Hiroshi Toyoda, Isesaki; Shigemi Shimizu, Sakai; Kiyoshi Terauchi, and Masaharu Hiraga, both of Isesaki, all of Japan, assignors to Sankyo Electric Co., Ltd., Japan

Filed Apr. 14, 1975, Ser. No. 568,001

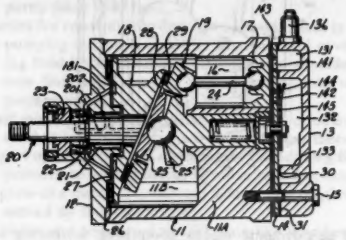
Claims priority, application Japan, Apr. 15, 1974, 49-42590[U]; Apr. 15, 1974, 49-42591[U]; Sept. 10, 1974, 49-109398[U]; July 10, 1974, 48-78813

Int. Cl.[2] F04B *1/12*; F01M *1/00*

U.S. Cl. 417—269 12 Claims

1. A refrigerant compressor having at least one piston reciprocated by means of a wobble plate means driven by an input rotor means and an input shaft means connected with said rotor means, a housing for said compressor including a cylinder block for said at least one piston and a sump chamber adjacent said cylinder block housing said wobble plate and said input rotor, a first end plate means on said housing including journal bearing means for bearing said input shaft, a shaft seal cavity and shaft seal means mounted on and around said input shaft in said shaft seal cavity, a second end plate means at the opposite end of said housing including refrigerant suction and discharge chambers and valve means selectively interconnecting the same with said cylinder block, first peripheral bearing means between said input rotor means and said first end plate means, second peripheral bearing means between said input rotor means and said wobble plate means,

and lubrication oil contained in said sump chamber, which is characterized in that said input shaft has a first oil flow port extending from a first predetermined oil flow gap between said rotor means and said wobble plate to said shaft seal cavity and a second oil flow port communicating between said first oil flow gap and said journal bearing, said first end plate means comprising at least one third oil flow port extending from said shaft seal cavity to a second predetermined oil flow gap between said input rotor means and said first end plate means,



and said input rotor means having an annular recess which is formed in a surface thereof facing said second oil flow gap and in eccentricity from the rotating axis of said rotor, whereby the lubrication oil flowing from said sump chamber to said second oil flow gap through said first oil flow gap, said first and second oil flow ports, said shaft seal cavity and said third oil flow port, said oil being returned to said sump chamber from said second oil flow gap after serving for lubrication of said journal bearing means, said first and second peripheral bearing means and said shaft seal means.

3,945,766

RADIAL PISTON MACHINE

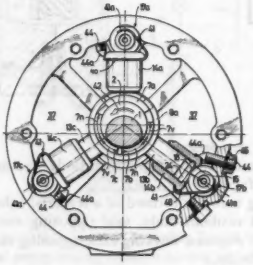
Robert Gelon, Lohr (Main), Germany, assignor to Rheinische Chamotte - und Dinas Werke, Bonn-Bad Godsperg, Germany

Filed Oct. 24, 1973, Ser. No. 409,337

Claims priority, application Germany, Oct. 28, 1972, 2253022

Int. Cl.² F04B *1/04, 21/00;* **F01B** *15/04*

U.S. Cl. 417—273 **19 Claims**



1. In a radial piston machine, especially in a radial piston pump, a combination comprising a rotor having an eccentric portion; a plurality of pistons extending radially of said rotor and having inner end portions cooperating with said eccentric portion so that said pistons move radially back and forth when said rotor rotates; discrete cylinders for said pistons, each of said cylinders having a chamber and an open end remote from said rotor and communicating with the respective chamber; a stationary back support for said cylinders, said back support having sealing surfaces each normally engaging only the open end of one of said cylinders; and a housing defining a fluid-containing compartment receiving said cylinders and said back support, each of said cylinders being arranged to radially retract at least a portion of its open end out of engagement with the respective sealing surface and to thereby allow fluid to flow between said compartment and the respective chamber in response to movement of the corresponding piston toward the axis of said rotor.

3,945,767

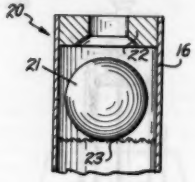
DAMPER APPARATUS

Abdullah M. Rokadia, Schaumberg, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 399,671, Sept. 21, 1973, Pat. No. 3,897,175. This application Aug. 8, 1974, Ser. No. 495,742

Int. Cl.² F04B *11/00*

U.S. Cl. 417—313 **2 Claims**



1. In combination with a liquid supply and a pulsating positive displacement pump, a conduit connected to said liquid supply at its inlet end and to the pump at its outlet end, said conduit carrying a plurality of upstanding open-ended tubes ccmmunicating with said conduit at their lower ends and extending upwardly to contain the liquid flowing in said conduit when said pump is not drawing liquid through said conduit, said tubes having float-operated check valves at the upper ends thereof to prevent spillover, and a flow meter interposed in the liquid supply to said conduit.

3,945,768

FLUID MOTOR DRIVES PUMP HAVING AN ACTIVE INLET VALVE

Donald K. Georgi, Minneapolis, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed Nov. 6, 1974, Ser. No. 521,292

Int. Cl.² F04B *9/00, 17/00, 35/00*

U.S. Cl. 417—317 **10 Claims**

1. In a reciprocating hydraulic motor and pump assembly, wherein the pump is mechanically linked to the reciprocating hydraulic motor and the motor has a hydraulic fluid inlet to its piston cylinder controllable by a valving mechanism responsive to motor piston displacement, the improvement comprising:

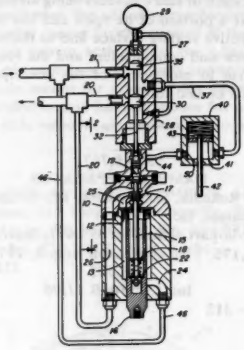
a. a hydraulic fluid line interposed between said motor hydraulic fluid inlet and said controlling valving mechanism, and having a hydraulic cylinder interposed therein, said hydraulic cylinder having a spring biased piston actuable by said hydraulic fluid and a valve rod connected to said spring biased piston;

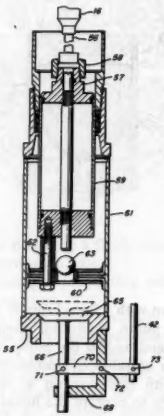
b. a poppet valve positioned at the pump inlet;

c. means for connecting said valve rod to said poppet inlet valve to cause said poppet valve to open and close in

response to said valve rod activation; and

d. further means connected between said hydraulic cylinder





and said motor hydraulic fluid inlet for restricting hydraulic fluid flow to said inlets until said valve rod is activated.

3,945,769

SELF-OSCILLATING FAN

Jeffrey P. Sanderson, P.O. Box 233, Rochelle, Ill. 61068

Filed Feb. 11, 1974, Ser. No. 440,955

Int. Cl.[2] F04B *9/02*

U.S. Cl. 417—361 **2 Claims**

1. A self-exciting oscillating fan comprising:

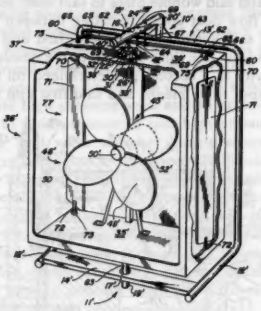
a. a stand;

b. a torsionally elastic means suspended from the stand and having its elastic axis lying on the vertical;

c. a first polar moment of inertia means including a fan housing and a motor fixedly mounted therein and having an armature connected to said fan, the housing being suspended from the said torsionally elastic means and having an axis of polar moment of inertia coincident with the axis of said torsionally elastic means;

d. a second polar moment of inertia means comprising said fan, the motor armature and a shaft extending therebetween, said second moment of inertia means having its axis of polar moment of inertia lying in a horizontal plane and intersecting the polar axis of said first polar moment of inertia coincident with the axis of rotation of said fan, motor armature and shaft; and

e. an aerodynamic means for self-exciting said first polar moment of inertia means in oscillation in a horizontal plane about said vertical elastic axis;



f. said aerodynamic means comprising feathering vanes pivotally mounted in said housing for rotation about axes substantially parallel to the axis of said torsionally elastic means and extending along each side of the fan adjacent the tips of the blades thereof; and

g. means for feathering said vanes.

3,945,770

HIGH PRESSURE PUMP

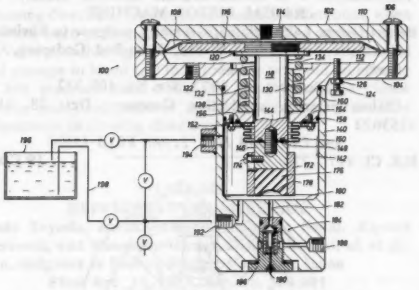
Robert H. Welker, P.O. Box 1228, Bellaire, Tex. 77401

Continuation of Ser. No. 321,330, Jan. 5, 1973, abandoned.

This application Nov. 6, 1974, Ser. No. 521,263

Int. Cl.[2] F04B *43/00;* **F01B** *19/00*

U.S. Cl. 417—401 **9 Claims**



1. A pump comprising

a resilient solid body of specified body size and having an exposed face;

an opposing member formed of a material relatively harder than said resilient body, said opposing member further having an exposed working face opposing the face of said resilient body;

an encircling peripheral shoulder on said resilient solid body which resiliently seals against said opposing member;

a generally circular cavity formed in one of said faces interiorally of said shoulder which seals about said cavity to capture without escape a fluid therein to be pumped, said cavity being closed to capture fluid by said resilient solid body on reciprocating said working face relative to the face of said resilient solid body, said cavity being sufficiently shallow in comparison with the size of said resilient solid body to enable said body to resiliently collapse into the cavity to thereby reduce the volume of said cavity within said shoulder to pump fluid from said cavity wherein the reduction of volume is substantial by all of

the volume and is a function of the relative movement of said faces toward one another;

means for positioning said resilient solid body and said working face at a specified location relative to one another;

an outlet passage means opening from said cavity providing an escape path for fluid pumped from said cavity when said cavity is reduced in volume;

means adapted to capture a fluid to be pumped in the vicinity of said opposing faces so that said cavity is at least partly filled with fluid;

means for relatively moving said opposing faces in repetitive pumping motion toward one another, said cavity capturing fluid between said faces inside said shoulder to pressure fluid in a pumping action flowing into said outlet passage means;

said moving means comprising a generally circular chamber divided into two portions by a diaphragm thereacross;

a port opening into said chamber for introducing fluid under pressure to said chamber to move said diaphragm;

a plate-like member contacted against said diaphragm to be moved by said diaphragm;

a piston rod connected to said plate-like member;

a body surrounding said piston rod and connected to said chamber;

a seal means cooperative with said body and said piston rod for sealing against leakage therepast;

said seal means being constructed and arranged such that one end of said piston rod is exposed within a generally closed internal cavity within a housing therein said cavity comprises a portion of said capturing means for fluid;

said moving means including an encircling hollow sleeve about said resilient member and slidably on an end of said piston rod, said sleeve exposing the face of said resilient member.

3,945,771

SUBMERGED PUMP

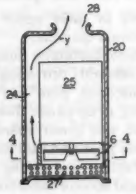
Shinichiro Arakawa, Fujisawa, Japan, assignor to Ebara Manufacturing Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1974, Ser. No. 511,468

Claims priority, application Japan, Oct. 16, 1973, 48-119417[U]

Int. Cl.² F04B *17/00;* **F04D** *29/44, 29/54*

U.S. Cl. 417—424 **4 Claims**



1. A submersible pump for pumping liquid comprising:

a polygonal pump casing column having an inlet at one axial end of the column and an outlet at the opposite end of the column;

a motor positioned at the inlet of said column and a rotary shaft fitted to and downward from said motor;

a cylindrical motor casing means for containing therein said motor and shaft, said casing means being fitted within said casing column with the casing means substantially inscribing each of the respective walls of the casing column and forming a plurality of columnar spaces substantially isolated from each other between the outer surface of the motor casing means and the inner surface of the pump casing column parallel to the axis of the cylindrical casing means;

an impeller mounted on said shaft near the inlet to said column; and

a plurality of volutes within said pump casing column near said inlet port, beneath said motor casing and surrounding said impeller, forming a plurality of discharge passages from the inlet port discharging into the columnar spaces around the motor casing, the number of volutes and passages corresponding to the number of columnar spaces between the pump casing and the motor casing, whereby the liquid impelled through the inlet by the impeller discharges through said passages into the columnar spaces and is directed axially upward therethrough to the outlet.

3,945,772

PUMPS FOR TRANSFERRING SMALL QUANTITIES OF DOSED LIQUIDS

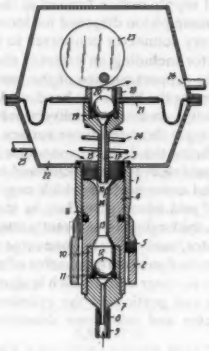
Gudio Van de Moortele, Bridel, Luxemburg, assignor to Unitas S.A., Luxemburg, Luxemburg

Filed May 22, 1974, Ser. No. 472,195

Claims priority, application Belgium, May 25, 1973, 52798

Int. Cl.² F04B *23/00;* **F01B** *31/14;* **B67D** *5/56*

U.S. Cl. 417—489 **4 Claims**



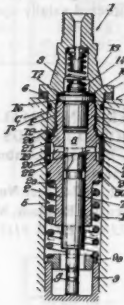
1. A pump for transferring small quantities of dosed liquids, comprising a cylinder, an axial inlet bore in said cylinder for alternately receiving and discharging dosed liquid, a valve being provided at one end of said bore controlling the suction of liquid in said bore, the other end of said bore being in communication with a space for another liquid or gas at a higher pressure than the first mentioned liquid, a plunger being disposed above the other end of said inlet bore and in said space, said plunger being provided with an axial bore and a valve housing with valve for controlling the evacuation of the dosed liquid out of the inlet bore of said cylinder when the plunger penetrates in the bore of said cylinder, means for obtaining the axial displacement between said plunger and said cylinder and for bringing said plunger alternately within and without said cylinder, whereby in the latter mentioned position of said plunger the liquid which has been fed into said inlet bore of said cylinder is brought up to the same pressure as that which prevails in said space.

3,945,773

HYDRAULIC HEADS FOR INJECTION PUMPS AND THE INJECTION PUMPS THEMSELVES

André Vuaille, Lyon, France, assignor to Sigma Diesel, Venissieux, France

Filed Aug. 23, 1974, Ser. No. 500,078
Claims priority, application France, Sept. 5, 1973, 73.32047
Int. Cl.[2] F04B 7/04, 37/10
U.S. Cl. 417—494 4 Claims



1. A hydraulic head for a fuel injection pump including a casing defining a housing and a support surface, said head comprising: a cylinder defining a pump chamber and including at least one fuel supply orifice formed in the cylindrical side wall thereof, a pump piston disposed for movement within the cylinder, a delivery connector connected to the cylinder, said delivery connector including an external shoulder which cooperates with the support surface of the pump casing to provide an axial stop for the hydraulic head, said delivery connector further including an internal delivery valve and a depending housing having a threaded inner surface, the end portion of the cylinder facing the delivery connector being received in said housing of said delivery connector and including complementary threaded outer surface which engages the threaded inner surface of said housing so that, in the fully assembled hydraulic head, said cylinder is directly suspended from the delivery connector, said delivery connector also including an internal shoulder and said delivery valve of said delivery connector including an outer collar which is clamped between the end wall of the end portion of the cylinder adjacent to the delivery connector and said inner shoulder of the delivery connector.

3,945,774

ANCHORABLE PACK-OFF ASSEMBLY

John R. Doan, 305 W. Walnut St., Robinson, Ill. 62454

Filed Mar. 25, 1974, Ser. No. 454,312
Int. Cl.[2] F04B 21/04
U.S. Cl. 417—554 7 Claims

1. Well pump apparatus for connection to and operation by a reciprocating string of sucker rods which extend downwardly into a well tubing, comprising: said tubing constituting an outer pump casing;

a one-way first valve mounted within said tubing permitting upward fluid flow;

a hollow member of lesser outer diameter than the inner diameter of said tubing disposed within said tubing and connected to said string of sucker rods for reciprocation;

lower and upper plungers carried by said hollow member above said first valve in spaced relation and in sealed sliding engagement with said tubing, each of said plungers having a fluid passageway therein in a fluid communication path with said hollow member and said first valve;

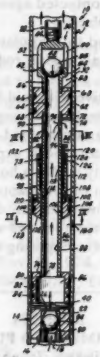
a one-way second valve mounted for reciprocation with said hollow member and operable to provide communication between the fluid communication path and the interior of said tubing above said upper plunger; and

a pack-off assembly anchored in a forced fit in sealed relation within and with respect to the inner surface of said tubing, said pack-off assembly forced into its anchored position by said upper piston and removed from its anchored position by said lower piston in response to a downward force and an upward force, respectively, applied to the sucker rods,

said pack-off assembly including

chamber dividing means receiving said hollow member in sealed sliding engagement between said upper and lower plungers to form upper and lower pumping chambers of equal diameter,

said hollow member including fluid passage means above said pack-off assembly providing communication of the fluid communication path and said upper chamber, whereby during an up stroke fluid is drawn through said first valve into said lower chamber and via said fluid communication path and said fluid passage means into said upper chamber and during a down stroke fluid is expelled via said second valve from said lower chamber via said fluid communication path and from said upper chamber via said fluid passage means and said fluid communication path upwardly through said tubing.



3,945,775

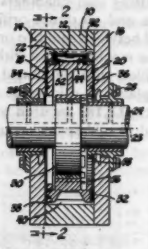
ROTARY COMBUSTION ENGINE DAMPED APEX SEAL

Paul J. Louzecky, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 15, 1974, Ser. No. 514,757
Int. Cl.[2] F01C 19/02; F04C 27/00
U.S. Cl. 418—113 6 Claims

1. An internal combustion rotary engine comprising a rotor housing, a rotor having apex seals sliding on said rotor housing as the rotor rotates, and damper means secured to each said

apex seal having a natural frequency substantially equal to the frequency of said rotor housing excited by the engine firing



cycle whereby there is effected a nodal drive to dampen apex seal vibration caused by said rotor housing.

3,945,776

STRUCTURE FOR PREVENTING OIL LEAKAGE IN A ROTARY ENGINE

Minoru Morita, Nago, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Apr. 17, 1974, Ser. No. 461,657

Claims priority, application Japan, Dec. 29, 1973, 48-49580

Int. Cl.² F01C *19/08*; F04C *27/00*; F01C *21/00*

U.S. Cl. 418—142 **7 Claims**

1. A structure for preventing oil leakage in a rotary engine which comprises a casing having at least two side housings and a center housing positioned therebetween, a rotor, rotatably disposed within said casing, said rotor being adapted to rotate eccentrically within said casing, an annular oil seal groove formed in the side wall of the rotor, an annular oil seal ring mounted in said annular oil seal groove for maintaining gas tightness and oil tightness between a side wall of the rotor and a side housing, and at least one oil groove formed in the side wall of the rotor and located radially inside of said annular oil seal groove, said oil groove having a gradually increasing cross-sectional area from its radial outer end toward its radial inner end, a closed radial outer end and an opened radial inner end, said oil groove extending helically around the center of the rotor.

3,945,777

BEARING AND BEARING SUPPORT FOR ROTARY PISTON ENGINE FOR COMPRESSING AND EXPANDING GASES

Herwig Labus, Julich, Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

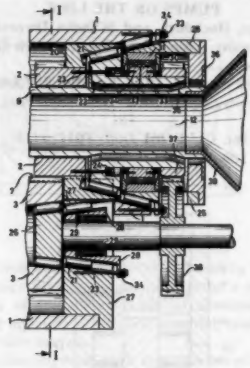
Filed Dec. 19, 1974, Ser. No. 534,417

Claims priority, application Germany, Dec. 19, 1973, 2363066

Int. Cl.² F04C *17/10*; F16C *13/06*

U.S. Cl. 418—188 **6 Claims**

1. A rotary piston engine for compressing or expanding gases and comprising; intersecting partial cups on parallel adjacent axes forming a housing, said cups being open near one region of intersection thereof, a rotary piston in each cup, said pistons having meshing labyrinth seal means and each having a radical projection which runs closely inside the pertaining cup, each piston having a pocket to receive the projection on the other piston, said projections being in side by side relation when disposed in said pockets, a hollow shaft coaxial with one piston and opening outside the housing at one end and having an axial slot, the pocket in said one piston having a port which communicates with said slot in one rotated position of said one piston, means for driving the pistons in rotation in unison in respective directions, bearings journaling said



pistons in said housing and supports for said bearings, and means interposed between each said support and at least one of the respective said piston and housing for relieving stresses due to thermal expansion and contraction, said means comprising opposed spaced parallel surfaces on said support and said one of said pistons and housing, said surfaces being annular segments of parallel cones on the axis of relative rotation of the respective piston and the housing, and connecting bodies interposed between and engaged by said surfaces, said supports including at least one support for each bearing connected to one of said housing and respective piston for resilient axial movement.

3,945,778

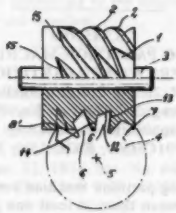
COMPRESSORS AND EXPANSION MACHINES OF THE SINGLE WORM TYPE

Bernard Zimmern, 27 rue Delabordere, Neuilly-sur-Seine (Hauts-de-Seine), France (92200)

Filed Oct. 22, 1974, Ser. No. 516,984

Int. Cl.² F04C *17/10*; F16H *1/16*, *55/08*, *55/22*

U.S. Cl. 418—195 **1 Claim**



1. A compressor or rotary expansion machine comprising a globoidal worm which has a plurality of threads disposed in meshing engagement with at least one toothed pinion and

which cooperates with a casing applied against at least part of the external surface of the worm, the generating line of the surface which is circumscribed about the thread crests of the worm being substantially rectilinear, at least one low-pressure port and at least one high-pressure port located in the immediate vicinity of the pinion, the flank of each tooth of said pinion which is located on the side nearest said low-pressure port when one tooth is engaged in the worm being longer than the flank of the same tooth which is located nearest said high-pressure port.

3,945,779

BEARINGS FOR THE TRUNNIONS OF GEARS IN GEAR PUMPS OR THE LIKE

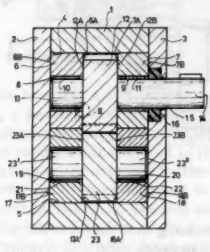
Jan Vlemmings, Hochdorf, and Wilhelm Dworak, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 15, 1974, Ser. No. 497,646

Claims priority, application Germany, Aug. 30, 1973, 7331510

Int. Cl.² F16H 1/06; F01C 1/18

U.S. Cl. 418—206 **15 Claims**



1. In a gear pump or an analogous fluid displacing machine, a combination comprising a pair of mating rotary gears each having two end faces and one of said gears having a trunnion extending from one of the respective end faces; and a bearing structure including a ring-shaped body surrounding said trunnion and having a surface immediately adjacent to said one end face of said one gear, said trunnion being urged against said bearing structure when the machine displaces fluid whereby said trunnion applies against said body a resultant force acting substantially radially of said body and tending to deform that portion of said body which is located within a predetermined distance from the locus of application of said force to said bearing structure, said bearing structure having means for confining the ambit of said force to a region of said body which is remote from said surface so that the application of said force does not entail appreciable distortion of said surface such as would result in wear owing to friction between said surface and said one end face due to immediate proximity of said surface to said one end face.

3,945,780

ROTARY SLIDING PARTITION MACHINE WITH FLUID CHAMBERS AT THE PARTITION ENDS

Jean Pierre Marcel, 20 rue E. Roux, Ruelle, France (16600)

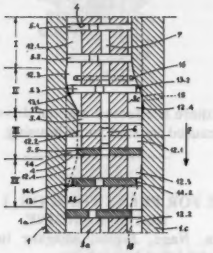
Filed Aug. 5, 1974, Ser. No. 494,922

Claims priority, application France, Aug. 9, 1973, 73.29138

Int. Cl.² F01C 1/00; F03C 3/00; F04C 1/00

U.S. Cl. 418—232 **6 Claims**

1. A rotary sliding partition machine comprising: two units (1,3) defining between them at least one groove (7) of constant cross-section, and movable one relative to the other in the direction of said groove; at least one piston (6) secured to one of said units, which piston has a working section mating with the cross-section of said groove and is engaged in a fluid-tight manner in said groove; elongated partitions (5) with two end portions and movable in the other of said two units in a direction transverse to said groove in such a manner as to create fluid work chambers (10,11) selectively in said groove; means (8,9) for putting said chambers into communication with an inlet orifice and an outlet orifice for the fluid; two space means formed between said two units in communication with a portion of the machine filled with fluid in such a manner as also to be filled with fluid, said end portions of said partitions being displaced in said space means; and partition-controlling elements (17,18) secured to said piston-carrying unit (1) and located in said space means, said partition-con-



trolling elements extending in the direction of said groove alternately in one and in the other of said two space means in the direction of movement of said partitions toward said end portions of said partitions to determine between the end portions of any two successive partitions periodically variable volumetric capacities (12-1, 12-2, 12-3, 12-4), the dimension of said partition-controlling elements in a direction at right angles both to the direction of said groove and to the direction of displacement of said partitions being such that the variation of volume each of said periodically variable volumetric capacities is equal to at least the volume of that part of each partition which penetrates cyclically into said space means.

3,945,781

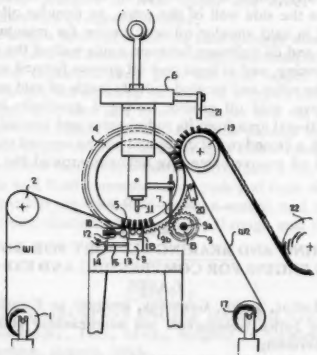
MOLDING APPARATUS TO FORM A THREE DIMENSIONAL PRODUCT ON A WEB MATERIAL

Jack Doleman, 5580 New Haven Ave., Melbourne, Fla. 32091

Filed Dec. 21, 1972, Ser. No. 317,192

Int. Cl.² B29F 1/00; B29C 3/02

U.S. Cl. 425—115 **8 Claims**



1. Apparatus for the continuous production of a molded three-dimensional product comprising;

a mold having a plurality of rows of spaced mold cavities therein, the rows being movable through a first station at which controlled charges of flowable thermoplastic mate-

rial are simultaneously introduced only into each mold cavity of the row at said first station;

a second station at which a web of a material which is permeable to the thermoplastic material is introduced into the open end of said mold cavities, one row at a time, and bonded to the spaced thermoplastic material charges therein; and

a third station at which the molded thermoplastic material bonded to the web is removed from the mold;

wherein the mold comprises a drum having angularly spaced rows of cavities therein, each cavity containing an insert which defines the shape and form of the thermoplastic material to be bonded to the web.

3,945,782

CONCRETE PIPES

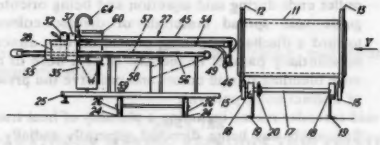
Robert M. Farahar, Sevenoaks, England, assignor to Amey Roadstone Corporation Limited, London, England

Division of Ser. No. 370,145, June 14, 1973. This application July 7, 1975, Ser. No. 593,790

Claims priority, application United Kingdom, July 27, 1972, 35184/72

Int. Cl.² B29C 5/00; B29D 3/02, 23/08

U.S. Cl. 425—127 **8 Claims**



1. Apparatus for making a pipe comprising a body formed by an integrally cast mass of cementitious material including a cement matrix and a glass fibre roving reinforcing said body, said roving forming a winding extending around said body along the length thereof, said roving being incorporated in said cement matrix, said apparatus comprising a centrifugal pipe mould, means for rotating said mould, means for feeding a glass fibre roving to the inside of said mould in a position in which said roving impinges on an internal peripheral face of said mould and means for moving said feeding device axially within said mould.

3,945,783

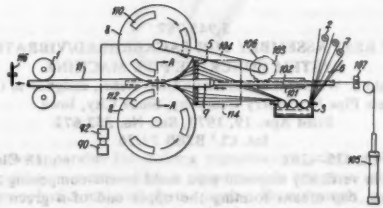
FIBRE REINFORCED COMPOSITES

William Paton, Eaglesham, Scotland, assignor to National Research Development Corporation, London, England

Filed Apr. 5, 1974, Ser. No. 458,431

Int. Cl.² B29D 23/00

U.S. Cl. 425—122 **15 Claims**



1. An apparatus for use in the continuous production of elongate articles of fibre reinforced composite material comprises a forming die of variable aperture, means for controlling this aperture in relation to the linear displacement of the composite material through the die cavity to produce an elongate article of predetermined varying external cross section, and means for providing continuous reinforcement fibres extending throughout the length of the article.

3,945,784

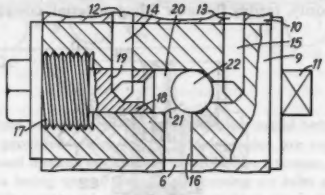
INJECTION MOULDING MACHINERY

Thomas Robert Stephen Collins, Letchworth, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 18, 1974, Ser. No. 434,641

Int. Cl.² B29F 1/05

U.S. Cl. 425—130 **5 Claims**



1. An injection unit of an injection moulding machine, for injecting plastics material sequentially into a mould cavity with injection of the second material commencing before completion of injection of the first material, comprising

a. two injection barrels;

b. ducts connecting with each injection barrel;

c. a passage, each end of which connects to one of said ducts, said passage having an opening in its wall, intermediate said ends, the width of said opening being less than the width of said passage;

d. a single channel for connection of said opening with a sprue passage of a mould cavity;

e. means to force plastics material from each barrel into the mould cavity via said ducts, passage, channel and sprue passage;

f. isolator means, having an on-position for communicating the single channel with the injection barrels and an off-position wherein both injection barrels are isolated from the single channel at a location upstream of said passage; and

g. a shuttle located in said passage and being moveable, under the action of the pressure exerted by the plastics material, along the length of the passage, said shuttle having a cross-section substantially the same as the passage and at each extremity of its movement blocking the duct at that end of the passage to prevent flow of material from that duct to the single channel, and said shuttle at no time completely blocks said opening so that, when the isolator means is in the on-position, depending on the position of the shuttle, one or other or both of the injection barrels are connected to the single channel via said ducts, passage and opening.

3,945,785

APPARATUS FOR FILLING EDIBLE PRODUCTS

Thomas E. Belshaw; Fred G. Woodworth, both of Seattle, and Wilbur D. Wilke, Camano Island, all of Wash., assignors to Belshaw Brothers, Inc., Seattle, Wash.

Filed Apr. 22, 1974, Ser. No. 463,155

Int. Cl.² A21C 9/06, 11/18

U.S. Cl. 425—132 **21 Claims**

1. Apparatus for filling edible products with a filling material, comprising:

a product material hopper having a forming cylinder,

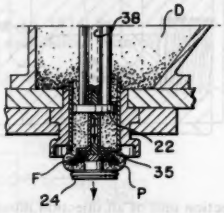
forming piston means reciprocably mounted in said forming cylinder,

metering piston means axially spaced from said forming piston means and independently reciprocably mounted in said forming cylinder,

means for reciprocating the forming and metering piston means in said forming cylinder to trap a quantity of product material and extrude it radially outwardly of said forming cylinder in an annular ring, and

means within said forming cylinder for injecting a ring of filling material substantially radially outwardly into said ring of product material, said injecting means including annular nozzle means providing split product material flow passages over and through said nozzle means whereby the filling material is injected into the space between said split paths.

3. Apparatus for filling edible products with a relatively low-viscosity, readily flowable filling material, comprising:



means for partially forming th product into its final form in an atmosphere of a first pressure,

nozzle means having a discharge orifice for injecting filling material into said partially formed product,

means applying a positive pressure and a negative pressure less than said first pressure on said filling material for respectively injecting filling material against said product material and for withdrawing a portion of the filling material into said nozzle means and pulling a portion of the product material against said nozzle means discharge orifice for sealing the orifice against filling material leakage, and

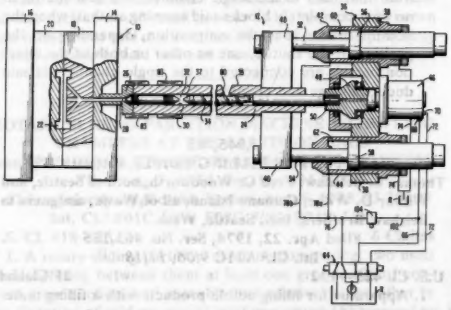
means for finally forming the product between said nozzle and said injected filling material to form a final product completely sealing said filling material.

3,945,786

INJECTION MOLDING APPARATUS FOR PRODUCING ARTICLES WITH A MOTTLED APPEARANCE

Thomas G. Bishop, Mount Gilead, Ohio, assignor to Koehring Company, Milwaukee, Wis.

Filed July 25, 1973, Ser. No. 382,500
Int. Cl.² B29F 1/04
U.S. Cl. 425—208 **9 Claims**



1. In molding apparatus of the type in which materials of diverse coloration are mixed and melted within an injector mechanism and subsequently injected into a mold cavity to form an article of generally mottled appearance, the improvement wherein said injector mechanism comprises:

a housing having inner bore-defining surface means and a discharge opening;

a softener screw disposed in a rearward portion of said bore;

rotary means operably connected to said softener screw to rotate said softener screw to displace said diversely colored materials forwardly and discharge said materials from said screw in a softened condition but short of a fully blended condition so that distinct color patterns are present;

translating means operably connected to said translating screw to produce translation of said screw relative to said bore to displace softened materials toward said discharge opening;

heating means for heating a portion of said housing forwardly of said softener screw; and

spreader means disposed in said bore intermediate said discharge opening and the front of said screw, said spreader means defining passage means at its outer periphery for spreading the softened materials of diverse coloration into a thin travel pattern along a heated portion of said housing for absorbing additional heat from said housing to facilitate melting of said spread materials of diverse coloration;

said passage means being unobstructed at its inlet and outlet ends during said injection and being oriented to guide said spread materials of diverse coloration toward a discharge opening of said bore in directions substantially parallel to the axis of said bore to minimize blending of said colors and preserve the presence of distinct color patterns;

said spreader means including a plurality of heat transfer fins, such fins being directed generally radially outwardly toward said bore-defining surface means to transmit heat therefrom; said bore-defining surface means being longitudinally stationary relative to said fins;

the portion of said bore disposed between said spreader means and said screw defining a materials conducting conduit that is operable to preserve the presence of distinct color patterns in said materials during advancement of said materials toward said spreader means.

3,945,787

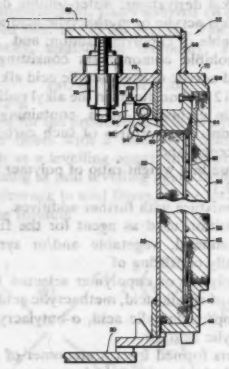
CAP REST ASSEMBLY FOR PACKERHEAD/VIBRATION SYSTEM CONCRETE PIPE MACHINE

Ronald J. Walchek, South Sioux City, Nebr., assignor to Concrete Pipe Machinery Company, Sioux City, Iowa

Filed Apr. 19, 1973, Ser. No. 352,672
Int. Cl.² B28B 21/26
U.S. Cl. 425—262 **18 Claims**

1. In vertically disposed pipe mold means comprising core means, cap means forming the upper end of a green pipe interiorally of said pipe mold means and means for moving said cap means downwardly with respect to said pipe mold means; releasable cap support means for supporting said cap means, said cap support means including releasing means thereon beneath said cap means for non-manually, automatically releasing support of said cap means in response to forced downward movement of said cap means against said cap sup-

port means, said releasing means and said cap support means being forced to a position other than beneath said cap means



to thereby release support of said cap means by said releasable cap support means.

3,945,788

APPARATUS OF MAKING REPRODUCTION PRINTING PLATES

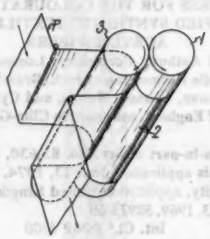
Yoshimi Inoue, Yokohama, and Takeo Yukie, Machida, both of Japan, assignors to Kabushiki Kaisha Asahi Shimbunsha, Japan

Continuation-in-part of Ser. No. 365,857, June 1, 1973, abandoned, and a continuation of Ser. No. 484,947, July 31, 1974, said Ser. No. 365,857, is a division of Ser. No. 253,774, May 16, 1972, abandoned, said Ser. No. 484,947, is a continuation-in-part of Ser. No. 253,774,. This application June 13, 1975, Ser. No. 586,547

Claims priority, application Japan, June 29, 1971, 46-47463

Int. Cl.² B29C *15/00*

U.S. Cl. 425—363 4 Claims



1. An apparatus for making reproduction printing plates comprising, a matrix which is air permeable but stops molten theremoplastic material from passing therethrough, a roll member, said matrix being detachably mounted on the outer surface of said roll member, an opposing member disposed against said roll member with a predetermined gap therebetween means for supplying molten thermoplastic material to said gap, and means for driving at least one of said roll and opposing members to press and roll said molten thermoplastic material and form said reproduction printing plates therefrom.

3,945,789

DUAL-BELT PRESS

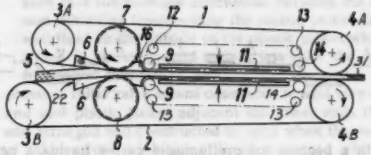
Karl Gunnar Boman, Neckarrems, Germany, assignor to Sandco Limited, Ottawa, Canada

Filed Apr. 22, 1975, Ser. No. 570,399

Claims priority, application Germany, Apr. 24, 1974, 2419706

Int. Cl.² B29J *5/04*, *5/08*; B29C *15/00*

U.S. Cl. 425—371 12 Claims



1. A dual-belt press in which two endless metal belts or the like are provided which on their facing sides are supported and pressed against each other by rollerlike pressure bodies, said belts being spread apart and forming an inlet area for compressing material masses, characterized by including a pair of compression rollers which form a compacting zone along said inlet area and which are diametrically opposed in the vicinity of the narrowest point of said inlet area between said belts, and supporting shoes which bear against the belts and bridge the space along said compacting zone and between the line of contact of said belt and said compacting roll and between the belt and the rollerlike pressure bodies.

3,945,790

PRESSING DEVICE FOR MANUFACTURING OF STORAGE SUBSTRATES

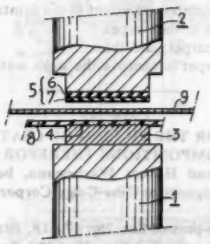
Claude Puech, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 4, 1973, Ser. No. 421,715

Claims priority, application France, Dec. 8, 1972, 72.43739

Int. Cl.² B29C *3/00*

U.S. Cl. 425—385 13 Claims



1. A device for pressing thermoplastic material, designed to transfer to said thermoplastic material an impression carried by a rigid matrix, and comprising: a press having two rigid, first and second parallel plates, said matrix being attached to the first of said plates; heater means designed to raise said thermoplastic material to its impression temperature; means for uniformly distributing a pressure over the whole surface of said thermoplastic material, arranged between said thermoplastic material and the second of said plates, thus preventing any transverse displacements of said thermoplastic material during the pressing operation.

3,945,791

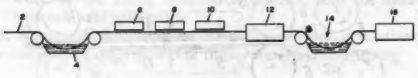
IN-REGISTER PRINTED AND EMBOSSED CARPET

Walter J. Bohrn, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Continuation-in-part of Ser. No. 51,210, June 30, 1970, abandoned, and a continuation-in-part of Ser. No. 157,889, June 29, 1971, abandoned. This application Mar. 29, 1974, Ser. No. 456,016

Int. Cl.² D06P *5/00*

U.S. Cl. 8—17 3 Claims



1. In a process for producing a carpet having a pattern printed thereon, said carpet being flexible and stretchable during handling, the pattern on the carpet having embossed design areas and non-embossed design areas in register, consisting of the steps of:

a. passing the carpet substantially continuously through a series of printing, steaming, washing and drying steps,

b. printing the carpet with at least one pattern component using only a dye to provide the pattern component,

c. moving the carpet to a second printing station wherein the previously printed pattern component will be in register with and abutting with the second pattern component to be printed,

d. printing the second pattern component in register and abutting with the first pattern component and using a printing ink containing a solvent for the carpet fibers, said solvent will cause the carpet fibers to shrink upon a subsequential steaming operation;

the improvement comprising:

1. controlling the viscosity and rheology of the printing inks to prevent bleeding of the different printing inks into each other to destroy the sharpness of the patterns printed, the rheology of the printing ink is such that it flows into the carpet when under shear, but has no flow laterally of the carpet when not under shear,

2. then within approximately 10 minutes of the last printing step, applying only then steam to the carpet to shrink the fibers printed and affected by the solvent to produce an embossed effect in the printed areas and to set the dyes in the carpet,

e. washing the carpet, and then

f. drying the carpet to remove the wash water.

3,945,792

PROCESS FOR THE FILLING OF LEATHER AND COMPOSITIONS THEREFOR

Albert Wurmli, and Hubert Wachsmann, both of Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 47,618, June 18, 1970, abandoned. This application Feb. 28, 1973, Ser. No. 336,571

Claims priority, application Switzerland, July 9, 1969, 10455/69

Int. Cl.² C14C *11/00*

U.S. Cl. 8—94.21 9 Claims

1. In a process for the filling of leather tanned with mineral, vegetable and/or synthetic tanning agents, the improvement which consists of treating the leather in the acid pH-range, with an aqueous solution of a filling agent consisting of

a. a homopolymer or copolymer selected from the group consisting of acrylic acid, methacrylic acid, α-ethylacrylic acid, α-isopropylacrylic acid, α-butylacrylic acid and α-chloroacrylic acid or

b. copolymers formed from a monomer of component (a) as defined above and a vinyl unsaturated monomer selected from the groups consisting of

α. water-soluble comonomers containing carboxylic acid groups, carboxylic acid amide groups and their N-hydroxyalkyl derivatives, water-soluble derivatives of β-hydroxyalkyl acrylic or methacrylic acid amides, or aldehydes capable of copolymerisation; and

β. water-insoluble comonomers consisting of optionally substituted acrylic or methacrylic acid alkyl esters having from 1 to 12 carbon atoms in the alkyl radical; vinyl esters of aliphatic carboxylic acids, containing from 1 to 12 carbon atoms, or mixtures of such carboxylic acids; or vinyl benzenes; and

c. protein glue in a weight ratio of polymer to glue of from 1:12 to 12:1,

alone or in admixture with further additives.

6. A composition used as agent for the filling of leather tanned with mineral, vegetable and/or synthetic tanning agents essentially consisting of

a. a homopolymer or copolymer selected from the group consisting of acrylic acid, methacrylic acid, α-ethylacrylic acid, α-isopropylacrylic acid, α-butylacrylic acid and α-chloroacrylic acid, or

b. copolymers formed from a monomer of component (a) as defined above and a vinyl unsaturated monomer selected from the groups consisting of

α. water-soluble comonomers containing carboxylic acid groups, carboxylic acid amide groups and their N-hydroxyalkyl derivatives, water-soluble derivatives of β-hydroxyalkyl acrylic or methacrylic acid amides, or aldehydes capable of copolymerisation; and

β. water-insoluble comonomers consisting of optionally substituted acrylic or methacrylic acid alkyl esters having from 1 to 12 carbon atoms in the alkyl radical; vinyl esters of aliphatic carboxylic acids, containing from 1 to 12 carbon atoms, or mixtures of such carboxylic acids; or vinyl benzenes; and

c. protein glue in a weight ratio of polymer to glue of from 1:12 to 12:1,

alone or in admixture with further additives.

3,945,793

PROCESS FOR THE COLOURATION OF ACID-MODIFIED SYNTHETIC TEXTILE FIBERS AND ACRYLIC FIBERS

George Samuel Anthony Corbishley; Leonard Walter Burns, both of Cheadle Hulme; James Jack, Bramhall; John Francis Edmund Keenan, Cheadle Hulme, and Cyril Hobday, Manchester, all of England, assignors to Ciba-Geigy AG, Switzerland

Continuation-in-part of Ser. No. 83,630, Oct. 23, 1970, abandoned. This application Jan. 23, 1974, Ser. No. 435,967

Claims priority, application United Kingdom, Oct. 25, 1969, 52379/69; Dec. 3, 1969, 58923/69

Int. Cl.² D06P *5/00*

U.S. Cl. 8—168 A 17 Claims

1. A process for the coloring of acidmodified polyester fibers or polyacrylonitrile fibers comprising treating said fibers with a preparation consisting essentially of an aqueous solution of a cationic dye and as dye carries an effective amount of at least one component having the formula Ia

$$R - O\text{-}(CH_2CH_2O)_n\text{-}H \qquad (Ia)$$

wherein R is a chloro-substituted phenyl group and *n* is an integer from 1 to 3.

3,945,794

PRODUCTION OF LEVEL DYEINGS ON ACRYLONITRILE POLYMER FIBERS WITH BASIC DYES

Rudolf Rokohl; Rolf Fikentscher, both of Ludwigshafen, Germany, and Herbert Helfert, Trenton, Mich., assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

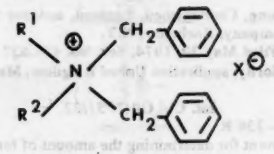
Filed Feb. 19, 1974, Ser. No. 443,824

Claims priority, application Germany, Feb. 24, 1973, 2309327

Int. Cl.² D06P 5/06

U.S. Cl. 8—172 R 5 Claims

1. In a process for the production of level dyeings on acrylonitrile polymer fibers with a basic dye using a quaternary ammonium salt as a levelling agent, the improvement which comprises utilizing as said levelling agent from 0.5 to 10% by weight, with reference to said fibers, of the quaternary ammonium salt of the formula



in which R^1 is alkyl of one to four carbon atoms or benzyl; R^2 is alkyl of one to four carbon atoms; or R^1 and R^2 taken together form a heterocyclic ring of four to six carbon atoms with N^+; and X is the radical of an organic or inorganic acid.

3,945,795

MEANS FOR PREVENTING DAMAGE TO JACKETED FLEXIBLE PUMPING STRAND

Herbert E. Townsend, Jr., Coopersburg, and James B. Horton, Bethlehem, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Apr. 3, 1974, Ser. No. 457,526

Int. Cl.² B05C 5/00; C23F 11/00; E21B 17/04, 43/00

U.S. Cl. 21—61 6 Claims

1. A corrosion and mechanical damage resistant flexible pumping strand assembly arranged and constructed to extend downwardly through oil well tubing positioned in an oil well and to connect at the lower end thereof to pumping means for pumping well fluid, which fluid includes corrosive substances, upwardly through said tubing, comprising:

a. a flexible wire strand comprising a plurality of wires with interstices between the wires,

b. a flexible plastic jacket disposed about at least that portion of said wire strand exposed to said well fluid and arranged and constructed to contain within the strand in the interstices between the wires of said strand a liquid that:

i. is corrosion inhibiting with respect to corrosive substances in said well fluid, and

ii. has a specific gravity similar to that of said well fluid such that the pressure differential between the corrosion inhibiting liquid within the plastic jacket and the well fluid on the outside of the plastic jacket when the strand is placed in said well is less than the rupture strength of said jacket, and

c. pressure relief valve means connected to said wire strand and said plastic jacket adjacent the lower ends thereof and arranged and constructed to open when the pressure of said corrosion inhibiting liquid contained within the plastic jacket in said interstices between the wires of the strand exceeds by a predetermined degree the pressure of said well fluid external of said plastic jacket, said predetermined degree defining a predetermined pressure differential adjacent said pressure relief valve means which is less than the pressure differential which will cause rupture of said plastic jacket.

3,945,796

APPARATUS FOR CONTINUOUS, AUTOMATIC STERILIZATION OF FLUID IN SEALED CONTAINERS

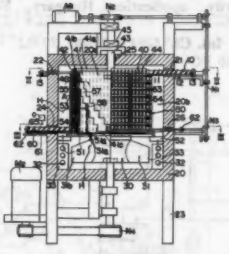
Kazuo Nagamatsu, Kobaya; Yoshitsugu Kinoshita, Osaka; Seizo Kawajiri, Kyoto, and Yoshiaki Uda, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

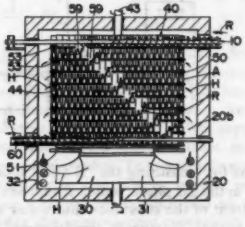
Filed July 2, 1973, Ser. No. 375,475

Claims priority, application Japan, July 6, 1972, 47-68082

Int. Cl.² A61L 3/00; B65G 37/00

U.S. Cl. 21—80 5 Claims





1. An apparatus for sterilization of fluid of sealed containers, comprising a chamber substantially hermetically sealed and having a supply point at one part of said chamber at which is a supply opening in said chamber land having a removal

point at another part of said chamber spaced from said supply point and at which is a removal opening, means for supply of containers to be treated extending from the outside of said chamber to the supply point through the supply opening of the chamber, means for removal of treated containers extending from the removal point to the outside of the chamber through the removal opening of the chamber, drum mounted to be rotatable about its vertical axis in said chamber having compartment defining means thereon defining a plurality of vertically stacked tiers of compartments for accommodation and transport of containers to be treated, said chamber having a plurality of bottom walls fixedly mounted therein one being associated with each tier of compartments and constituting the bottoms of said compartments, each bottom wall having a gap therein, the gaps being at different circumferential positions, the gaps being for transferring containers inserted and carried in compartments automatically one after the other to the next adjacent lower tier at said positions, means in said chamber for heating air and circulating the heated air in the chamber, each compartment having aperture means therein for permitting passage of the circulating hot air laterally therethrough in a direction transverse to the direction of transport of the containers for sterilizing the fluid contained in the containers, and drive means connected to said conveyor for continuously driving the conveyor to carry the containers within the compartments from the supply point to the removal point, said drive means, supply means and removal means being coupled for synchronous driving.

3,945,797

PROCESS AND APPARATUS FOR MEASURING THE ISOTOPE CONTENT OF SUBSTANCES LABELLED WITH ^3H OR ^3H AND ^{14}C ISOTOPES

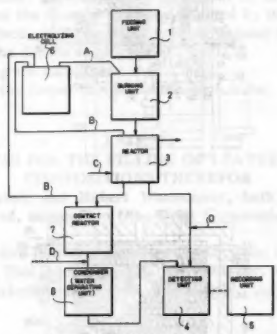
Sándor Mlinkó; Dezső Bánfi; István Gács; Károly Payer; László Ötvös; Zoltán Vargay; Emília Dobis née Farkas, and Tivadar Palágyi, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT., Budapest, Hungary

Filed Feb. 5, 1973, Ser. No. 329,605

Claims priority, application Hungary, Feb. 9, 1972, MA2317

Int. Cl.² G01N *23/00, 31/12*

U.S. Cl. 23—230 PC 7 Claims



1. A process for measuring the ^3H and ^{14}C isotope content of substances in the gas phase, which comprises converting the hydrogen content of the substance into water and the carbon content into carbon dioxide in simultaneous oxidation processes, separating the resulting water from the resulting carbon dioxide by passing them through a contact catalyst capable of retaining water and containing activated hydrogen and thereby bonding the ^3H content of the water, purifying the separated gas which contains $^{14}CO_2$, transfering the purified gas with a counting gas into a detector unit, then continuously converting the ^3H retained by said contact catalyst to a gas by exchange reaction with a flowing gas, and feeding the thus liberated ^3H-containing gas with a counting gas into a detectng unit.

5. Apparatus for measuring the isotope content of a sample labeled with a ^3H isotope or a ^3H isotope and a ^{14}C isotope, comprising a feeding unit, a burning unit connected from said feeding unit for converting the hydrogen content of the sample into water and any carbon content of the sample into a carbonaceous gas, a reactor connected from said burning unit, said reactor being charged with a contact catalyst for isolating the ^3H content of the water and converting it into a gas, at least one detecting unit connected from said reactor, and at least one recording unit connected from said detecting unit.

3,945,798

FORMALDEHYDE TEST ELEMENT AND METHOD OF USE

David J. Young, Chorleywood, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 20, 1974, Ser. No. 471,637

Claims priority, application United Kingdom, May 24, 1973, 24799/73

Int. Cl.² G01N *31/22*

U.S. Cl. 23—230 R 9 Claims

1. An element for determining the amount of formaldehyde present in a gaseous environment comprising a support having thereon a formaldehyde-sensitive layer comprising gelatin, pararosaniline or an acid derivative thereof, a sulphite ion and a hygroscopic agent.

3,945,799

METHOD FOR QUANTITATIVELY DETERMINING OXYGEN CONTENT ORGANIC COMPOUNDS

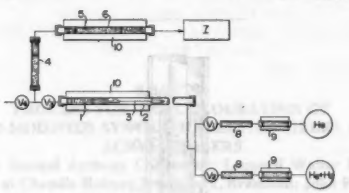
Haruo Honma, Tokyo, Japan, assignor to Rikagaku Kenkyusho, Japan

Filed June 6, 1974, Ser. No. 477,030

Claims priority, application Japan, June 8, 1973, 48-64454

Int. Cl.² G01N *31/12*

U.S. Cl. 23—230 PC 1 Claim



1. In the carbon-reduction quantitative method of determining oxygen in which an organic compound is subjected to thermal decomposition and oxygen is measured as oxides of carbon, the improvement comprising thermally decomposing said compound over a platinum-carbon or carbon catalyst in a static volume of inert gas containing a small amount of hydrogen or methane.

3,945,800

APPARATUS FOR COMBINED PROTECTION AGAINST NUCLEAR FALLOUT AND NUCLEAR SUFFOCATION

Charles J. Roos, 1832 E. Isabella Ave., Muskegon, Mich. 49442

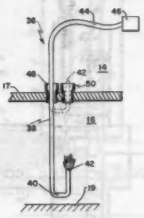
Filed July 13, 1972, Ser. No. 271,515

Int. Cl.² G01N *31/12;* E04H *9/00*

U.S. Cl. 23—232 R 6 Claims

1. Apparatus for determining a lack of oxygen within a building having a floor and upper and lower levels above and below said floor respectively and a certain atmosphere within

each level comprising a portable combustion means for testing an atmosphere having a flame exposed to said atmosphere; said combustion means including an elongated extension projecting therefrom bent into a J-shape, having a fluid passageway therethrough, and means for passing a combustible gas through said passageway, said J-shaped extension including a vertically upwardly extending opening for emitting said combustible gas upwardly to provide an upwardly extending flame visible from above; and aperture means in said floor for reciprocally raising and lowering said extension in said floor such that said combustion means may be lowered into the atmosphere of said lower level to test the oxygen quality of that atmosphere, said aperture means including a portion



allowing ignition of said combustible gas by raising of the portion of said extension including said opening through said floor for said ignition of said combustible gas at said opening whereby, when said extension is lowered into said lower level, said flame will be extinguished if there is sufficient lack of oxygen in said atmosphere of said lower level; said aperture means including a first aperture in which said extension is mounted for reciprocal raising and lowering and a second aperture comprising said portion of said aperture means through which the portion of said extension including said opening is passed for ignition of said flame and through which said flame is observed as said extension is lowered into said lower level atmosphere.

3,945,801

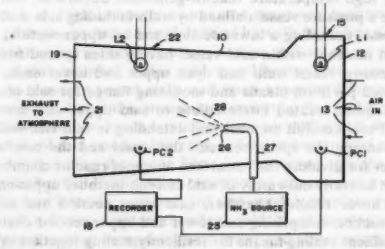
INDICATOR PROVIDING CONTINUOUS INDICATION OF THE PRESENCE OF A SPECIFIC POLLUTANT IN AIR

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Charles G. Miller, Pasadena, and Ralph E. Bartera, La Canada, both of Calif., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel Code-GP, Washington, D.C.

Filed Nov. 7, 1974, Ser. No. 521,817

Int. Cl.² G01N *1/22, 21/26*

U.S. Cl. 23—254 E **3 Claims**



1. A device for indicating the amount of a specific pollutant present among various pollutants in a stream of air comprising:

a single elongated hollow tube-like element having a first open end and a second open end, diametrically opposite said first open end, said first open end defining an inlet end through which a continuous stream of air containing various pollutants, including a specific pollutant, is adapted to enter and flow continuously downstream along the entire length of said element and exit through said second end defining an outlet end of said element;

a first photoelectric unit positioned upstream from said outlet end and including a first light source and first light sensitive means, positioned directly in the path of light from said source, for receiving the light directly directed thereto from said first light source, said first light sensitive means being spaced apart from said first light source in a direction perpendicular to the element's length direction along which the air flows from said inlet end to said outlet end, so that at least a portion of the air flowing through said element passes between said first light source and said first light sensitive means, the latter providing an output which is a function of the light directed thereto from said first light source and the light transmission characteristics of the air with the various pollutants including said specific pollutant contained therein; and

source means for injecting selected matter into the air flowing through said element at a location upstream from said first photoelectric unit, whereby the selected matter reacts inside said element with the specific pollutant in said air to form compound particles carried by said air past said first photoelectric unit, the air with said compound particles having light transmission characteristics which differ from those of the air with the specific pollutant therein.

3,945,802

EXHAUST GAS PURIFYING APPARATUS

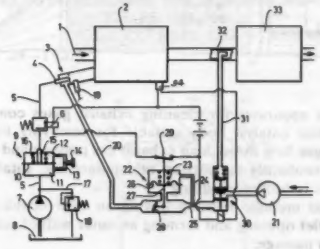
Konrad Eckert, Stuttgart-Feuerbach, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 11, 1973, Ser. No. 322,861

Claims priority, application Germany, Jan. 14, 1972, 2201739

Int. Cl.² F23G *7/06*; F01N *3/00*; F23N *1/02*

U.S. Cl. 23—277 C **6 Claims**



1. In an exhaust gas purifying apparatus for treating the exhaust gases in the exhaust line of the internal combustion engine, said apparatus being of the type that has (a) a reactor in said exhaust line, (b) a heating burner for heating said reactor to operating temperatures, (c) fuel supply means for delivering burner fuel to said heating burner, said fuel supply means including a fuel conduit, (d) air supply means for delivering combustion air to said heating burner, said air supply means including a burner air conduit and an air pump disposed in the latter, the improvement comprising an air control valve including:

A. a movable valve member situated in said burner air conduit downstream of said air pump;

B. flow regulating means coupled to said movable valve member for regulating the air quantity delivered to said heating burner to a constant value independently from

the counterpressure at said heating burner and independently from the output delivery of said air pump;

C. an additional reactor in said exhaust line;

D. an intermediate pipe forming part of said exhaust line and extending between said reactors;

E. a secondary air conduit extending from said burner air conduit to said intermediate pipe and opening in the direction of said additional reactor;

F. a routing valve in said burner air conduit between said air control valve and said air pump, said routing valve being connected to said secondary air conduit, said routing valve having a first position in which communication is maintained between said air pump and said air control valve and communication is blocked between said air pump and said secondary air conduit and a second position in which communication is mantained between said air pump and said secondary air conduit and communication is blocked between said air pump and said air control valve; and

G. a temperature sensor connected to said routing valve and responsive to the temperature of the reactor associated with said heating burner, said temperature sensor causing said routing valve to be moved from said first position to said second position when the reactor associated with said heating burner reaches its operating temperature.

3,945,803

ELASTIC SUPPORT FOR A CERAMIC MONOLITHIC CATALYZER BODY

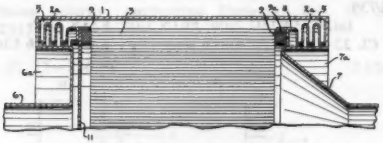
Reimar Musall; Wilhelm Wolsing, and Klaus Almeroth, all of Hannover, Germany, assignors to Kali-Chemie AG, Hannover, Germany

Filed Apr. 3, 1973, Ser. No. 347,559

Claims priority, application Germany, Apr. 7, 1972, 2216772

Int. Cl.² B01J *8/00*; F01N *3/15*

U.S. Cl. 23—288 FC **8 Claims**



1. An apparatus for cleaning exhaust gases comprising a monolithic catalyst body suitable for removing toxic gases from a gas flow through an exhaust gas passage and an elastic holder resiliently supporting said monolithic catalyst body, said elastic holder including

a rigid metallic housing having an inlet opening and an outlet opening and forming an outer wall of said exhaust gas passage;

resilient means operable to apply a resilient force upon being compressed, disposed within said housing and a major portion of which is spaced from said housing near each opening therein and being compressed, said resilient means comprising a corrugated wall device, the space between said resilent means and said housing forming an annular chamber near each opening in said housing;

inner circumferential plate means secured to said housing and dispoded therein for guiding and supporting said resilient means for axial movement thereof said plate means being disposed between said resilient means and said gas flow to thereby shield said resilient means from direct contact by the gases;

gripping end portions operably secured to and axially pressed by said compressed resilient means, said gripping end portions being positioned to suspend the monolithic catalyst body therebetween whereby the monolithic catalyst body is resiliently suspended, within said housing, between said gripping end portions.

3,945,804

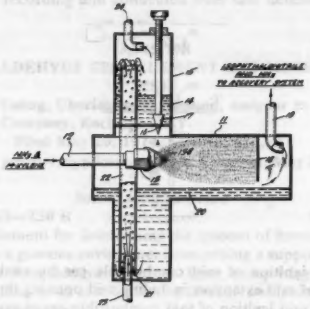
AMMOXIDATION APPARATUS

Jer-Yu Shang, Wilmington, Del., and Raymond Wynkoop, Gladwyne, Pa., assignors to Sun Ventures, Inc., St. Davids, Pa.

Division of Ser. No. 286,634, Sept. 6, 1972, Pat. No. 3,846,473. This application June 24, 1974, Ser. No. 482,060

Int. Cl.² B01J *8/10*

U.S. Cl. 23—288 E **2 Claims**



1. An apparatus for an ammoxidation process which comprises in combination a reactor vessel fitted with (a) input means for vapors of ammonia and hydrocarbon to supply said vapors to an atomizing apparatus within said reactor, (b) an upper reservoir for a molten eutectic salt catalyst, (c) means for feeding said molten eutectic salt from said upper reservoir to said atomizing apparatus, (d) a lower reservoir for spent molten salt, (e) a gas-lift having an inlet for an oxygen containing gas at the bottom of said lower reservoir to move said spent salt from said lower reservoir to said upper reservoir, (f) a vent from said upper reservoir to provide an exit for said lifting gas, and (g) an outlet from said reactor for removing the products of reaction between the ammonia and hydrocarbon.

3,945,805

REACTOR-GENERATOR APPARATUS

Norman F. Costello, and Neal A. Cook, both of Racine, Wis., assignors to Modine Manufacturing Company, Racine, Wis.

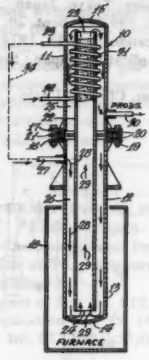
Filed Apr. 18, 1974, Ser. No. 461,856

Int. Cl.² B01J *3/04*, *1/00*

U.S. Cl. 23—290 **7 Claims**

1. A high temperature reactor-generator apparatus, comprising: a pressure vessel defined by walls including side walls, said vessel including a lower section and an upper section; a conduit member within said vessel having sides spaced from the pressure vessel walls and open upper and lower ends; a combined partition means and mounting flange for said conduit member located intermediate to said upper and lower ends of said conduit member and extending to said side walls and spanning the space between the vessel and the conduit member for dividing the vessel into an upper reactor chamber located laterally outwardly of said conduit member upper end and a lower reactor chamber, said lower section and said upper section comprising said lower and upper reactor chamber; resilient sealing means for resiliently sealing together said partition means and said upper and lower vessel sections; means for introducing a fluid reactant medium into said lower reactor chamber for flow therethrough and upwardly through said conduit member into said upper reactor chamber; means

for supplying heat to said lower reactor chamber; means for removing reaction products from said upper reactor chamber;



and means for flowing a fluid in heat exchange relationship with said upper reactor chamber.

3,945,806

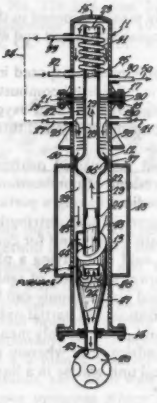
REACTOR-GENERATOR

Norman F. Costello, and Neal A. Cook, both of Racine, Wis., assignors to Modine Manufacturing Company, Racine, Wis.

Filed Apr. 18, 1974, Ser. No. 461,857

Int. Cl.² B01J *3/04, 1/00*

U.S. Cl. 23—290 **12 Claims**



1. A high temperature reactor-generator apparatus, comprising: a pressure vessel defined by walls including side walls, said vessel including a lower section and an upper section; a conduit member within said vessel having sides spaced from the pressure vessel walls and open upper and lower ends; a combined partition means and mounting flange for said conduit member located intermediate to said upper and lower ends of said conduit member and extending to said side walls and spanning the space between the vessel and the conduit member for dividing the vessel into an upper reactor chamber located laterally outwardly of said conduit member upper end and a lower reactor chamber, said lower section and said upper section comprising said lower and upper reactor chambers; resilient sealing means for resiliently sealing together said partition means and said upper and lower vessel sections; heating means for supplying heat to said lower reactor chamber adjacent to the bottom end thereof; restricted flow means for providing a restricted flow passage dividing said lower reactor chamber into an intermediate, preheat section essentially above said heating means and a heating section essentially at said heating means; fluid introducing means for introducing a fluid reactant medium into said intermediate, preheat section for flow in said intermediate, preheat section, through said restricted passage into said heating section and upwardly in said conduit member into said upper reactor chamber; and means for removing reaction products from said upper reactor chamber.

3,945,807

METAL TOOL

Riichi Fukutome, Kanagawa, Japan, assignor to Nihon Shinku Gijutsu Kabushiki Kaisha, Chigasasaki, Japan

Filed Nov. 15, 1973, Ser. No. 416,281

Claims priority, application Japan, Nov. 16, 1972, 47-114313

Int. Cl.² B22F *3/00;* **B21K** *5/02*

U.S. Cl. 29—182.3 **7 Claims**

1. A metal tool adapted for drilling holes in resin plates for wire printing, said tool comprising a cemented metal carbide base, and a iron-plated coating film on said base, said coating film being a noble metal selected from the group consisting of gold, silver and platinum, said coating film constituting a means for producing smooth drilled holes in the resin plates with prolonged usage.

4. A method comprising drilling holes in resin plates for wire printing with a tool formed by ion-plating a coating film on a metal carbide base, said coating film being a noble metal selected from the group consisting of gold, silver, and platinum, said film enabling the production of smooth drilled holes in the resin plates with prolonged usage.

3,945,808

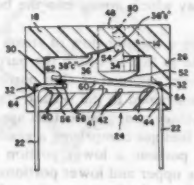
LEAD FRAME ADAPTED FOR ELECTRICAL SWITCH PACKAGE

Wilmer Lee Sheesley, Harrisburg, and William Vito Pauza, Palmyra, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 460,843, April 15, 1974, Pat. No. 3,900,709, which is a continuation-in-part of Ser. No. 454,530, March 25, 1974, abandoned. This application May 27, 1975, Ser. No. 581,400

Int. Cl.² H05K *7/18*

U.S. Cl. 29—193.5 **2 Claims**



1. A lead frame stamped from a sheet of conductive material adapted for use in an electrical switch package of the type having means therein for pushing one contact into engagement with another contact, which comprises:

a. a frame consisting of integral end carrier strips and side carrier strips;

b. one or more first contact members each containing a contact at the end of an arm of the member, said members extending inwardly from said side carrier strips; and

c. one or more second contact members each containing a contact as the end of a arm of the member, said second members being shorter than said arm of acid first members and extending inwardly from said side carrier strips and so positioned such that each second contact member

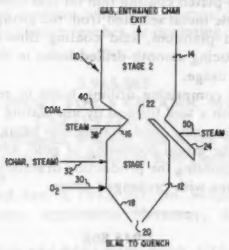
faces a first contact member extending inwardly from the opposing side strip and further, on a same side strip a first contact member is adjacent to a second contact member; said lead frame being in a U-shaped form with the contact on each first contact member overlapping the contact on the opposing contact member.

3,945,809

METHOD AND APPARATUS FOR REMOVING COARSE UNENTRAINED CHAR PARTICLES FROM THE SECOND STAGE OF A TWO-STAGE COAL GASIFIER

Ernest E. Donath, Christiansted, St. Croix, V.I., assignor to The United states of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 8, 1975, Ser. No. 594,165
Int. Cl.² C10K *3/06*
U.S. Cl. 48—73 **4 Claims**



1. A method for removing oversized char particles which are produced in a two-stage coal gasification process by reacting a first stage synthesis gas with coal and steam in a mixing zone in the second stage, and which are too large to be entrained in an upwardly directed second stage gas stream, said method comprising:

withdrawing said oversized char particles through an exit passageway which opens into the bottom of said mixing zone,

and directing a counter-flow of steam in a direction which is opposite to that in which the particles are removed so as to prevent removal of char particles of a size capable of being entrained in the second stage gas stream.

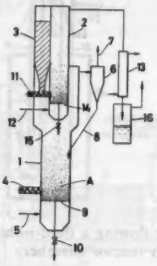
2. In a two-stage coal gasification apparatus for producing methane-rich fuel gas comprising a gasification vessel including an upper portion, a lower portion and a mixing throat connecting the upper and lower portions; means for passing a synthesis gas from the lower portion of the vessel upwardly into said mixing throat, and said mising throat including means for injecting coal and steam thereinto for mixing with the synthesis gas to produce partially gasified char which is entrained in a second stage product gas that passes upwardly through the upper portion of the vessel; the improvement comprising means for removing oversized char particles which are formed in said mixing throat and which are too large to be entrained in said second stage product gas, said means comprising means defining a downwardly extending exit passageway which opens into the bottom of said mixing throat and through which said oversized char particles can be removed and means for injecting a counter-flow of fluid in said passageway for preventing the removal of particles which are of a size capable of being entrained within said second stage product gas.

3,945,810

APPARATUS FOR DISPOSAL OF PLASTICS

Kiyosi Saito, Sapporo, Japan, assignor to Agency of Industrial Science and Technology, Tokyo, Japan

Division of Ser. No. 399,243, Sept. 20, 1973, Pat. No. 3,843,339. This application June 13, 1974, Ser. No. 479,089
Claims priority, application Japan, Sept. 25, 1972, 47-95599
Int. Cl.² C10J *3/56*
U.S. Cl. 48—76 **1 Claim**



1. A device for combusting plastics to reduce hydrocarbons useful for industrial raw materials which comprises

a. a first cylindrical fluidized combustion unit having disposed therein

1. a distributing plate which is disposed at the lower portion of said cylindrical fluidized combustion unit and is capable of supporting a fluidized medium within said unit;
2. a plastic supply means disposed in the lower portion of said fluidized combustion unit and above said distributing plate;
3. an oxygen supply means disposed in the lower portion of said cylindrical fluidized combustion unit and below said distributing plate such that oxygen introduced into said unit will pass upwardly and through said distributing plate;
4. means situated below said distributing plate for removal of the residue of combustion from said unit;
5. a fluidizing medium having a particle size of from 0.1 to 0.3 mm placed on said distributing plate;

b. a cylindrical plastic supply unit for containing a supply of plastic material, said unit having a plastic supply means situated at the lower extremity of said plastic supply unit through which said plastic supply can be fed into a second cylindrical fluidization and partial oxidation unit wherein at least part of said plastic supply means is situated within said second cylindrical unit wherein plastic fed into said second cylindrical unit will be in a liquid form as it enters said second unit;

c. said second cylindrical fluidization and partial oxidation unit having

1. a distributing plate which is disposed at the lower portion of said cylindrical fluidization and partial oxidation unit which is capable of supporting a fluidized medium within said unit;
2. a plastic supply means disposed in the lower portion of said cylindrical fluidization and partial oxidation unit and above said distributing plate;
3. an oxygen supply means disposed in the lower portion of said cylindrical fluidization and partial oxidation unit and below said distributing plate such that oxygen introduced into said unit will pass upwardly and through said distributing plate;
4. means situated below said distributing plate for removal of the residue of combustion from said unit;
5. a fluidizing medium placed on said distributing plate; said second cylindrical unit and said plastic supply

means for feeding said second cylindrical unit being situated within the upper empty space of the first cylindrical fluidized combustion unit and in heat exchange communication with the gases generated in said first unit when said first unit is used to combust a plastic supplied thereto;

d. a condenser connected to a gas outlet on said second cylindrical fluidization and partial oxidation unit such that volatile hydrocarbons generated within said second cylindrical unit are removed from said unit and are condensed within said condenser.

3,945,811
PROCESS FOR REMOVING SULFUR COMPOUNDS FROM GASES

Glenn H. Beasley, Cheltenham, and Peter G. Cartier, Cornwells Heights, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 512,815, Oct. 7, 1974, abandoned. This application Dec. 19, 1974, Ser. No. 534,385

Int. Cl.² B01D *53/02*

U.S. Cl. 55—73 **18 Claims**

1. A process for separating sulfur oxides from gaseous mixtures containing them which comprises contacting said gases with a crosslinked macroreticular resin comprising a functional moiety containing at least one basic nitrogen and at least one acid metal salt group thereby absorbing a substantial part of the sulfur oxide from the gaseous streams or mixtures.

3,945,812
METHOD OF FILTERING GREASE-LADEN AIR

Doane, DeWitt H., Rte. No. 2, Andover Road, Long Grove, Ill. 60047

Division of Ser. No. 326,266, Jan. 24, 1973, Pat. No. 3,870,494. This application Nov. 25, 1974, Ser. No. 526,636

Int. Cl.² B01D *45/06, 45/08*

U.S. Cl. 55—97 **8 Claims**

1. A grease filtering method for kitchen ventilating systems and the like, said method comprising the steps of providing a housing that is elongated in the X and Y directions and less than 2 inches in the Z direction so that the housing will fit in the space normally provided for mesh-type filters in a kitchen ventilating system, said housing forming closed top and bottom walls lying substantially in X-Z planes, closed side walls lying substantially in Y-Z planes, and front and rear walls lying substantial in X-Y planes, said front wall forming a multiplicity of spaced entrance openings which are uniformly elongated in the Y direction and relatively narrow in the X direction, each of said entrance openings formed by a pair of edges of said front wall elongated in the Y direction on opposite sides of the opening, said rear wall froming a multiplicity of exit openings each of which is midway between a pair of adjacent entrance openings, said exit openings also being uniformly elongated in the Y direction and relatively narrow in the X direction, a multiplicity of interior baffles lying substantially in Y-Z planes within said housing, each of said interior baffles comprising a single sheet of metal extending from a line midway between an adjacent pair of said exit openings on said rear wall to a line midway between an adjacent pair of said entrance openings on said front wall so that opposite sides of each of said interior baffles are exposed to said ajdacent pair of entrance openings, a multiplicity of entrance baffles equal to the number of entrance openings extending into said housing from the elongated edges of said entrance openings, each of said entrance baffles extending from one of the elongated edges of one of said entrance openings toward the side wall or the interior baffle that is closest to said entrance opening with the rear edge of each entrance being spaced farther away from said closest sidewall or interior baffle than the other elongated edge of its entrance opening, the entrance baffle originating at the entrance opening edge in said front wall that is farther away from said closest side wall or interior baffle and extending toward said closest side wall or interior baffle and extending toward said closest side wall or interior baffle at an acute angle relative to said front wall so as to deflect an entering exhaust stream toward said closest side wall or interior baffle as the exhaust stream passes rearwardly through said housing, and a multiplicity of exit baffles equal to the number of entrance baffles extending into said housing front the elongated edges of said exit openings, each of said exit baffles extending from an elongated edge of one of said exit openings toward the opposite elongated edge of the same exit opening at an acute angle relative to said rear wall so as to deflect the exhaust stream moving rearwardly from each entrance opening in the forward direction away from said rear wall before the exhaust stream is discharged through said exit opening, said bottom wall forming a multiplicity of drain openings adjacent said front wall and spaced away from said entrance openings in the X direction; passing an exhaust stream containing condensable grease and oil through said entrance openings and rearwardly between each of said entrance baffles and the adjacent Y-Z side wall or interior Y-Z baffle, then forwardly between each of said entrance baffles and the adjacent exit baffle, and finally rearwardly between each pair of exit baffles on opposite edges of each exit opening and out through the exit opening; and collecting extracted liquids drained through said drain openings below the bottom wall of said housing.

3,945,813
DUST COLLECTOR

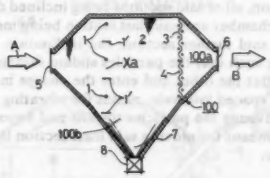
Koichi Iinoya, No. 105, Motoyama, Kamigamo, Kita-ku, Kyoto, and Kazutaka Makino, No. 954, Ichibancho, Hiyoshidai, Takatsuki, Osaka, both of Japan

Continuation-in-part of Ser. No. 240,928, April 4, 1972, abandoned. This application Jan. 16, 1975, Ser. No. 541,551

Claims priority, application Japan, Apr. 5, 1971, 46-20364; June 11, 1971, 46-41022; Nov. 4, 1971, 46-87121; Nov. 4, 1971, 46-87122

Int. Cl.² B03C *3/00*

U.S. Cl. 55—108 **3 Claims**



1. A combined dust-collector and filter assembly wherein a stationary, regid and hollow casing is provided for defining a passage having an inlet and an outlet opening positioned at opposite sides of said casing for the receiption of a dust-containing gas stream and for the discharge of a refined gas stream after passage through the interior space of said casing, respectively, a plurality of ionizing stationary electrodes are provided in proximity to said inlet opening for ionizing dust particles contained in the said inlet stream, a mechanical filter disposed across said entire passage for filtering off said ionized dust particles from said inlet gas stream flowing through said filter, a plurality of dust-repulsing electrodes are positioned in close proximity to or within the material of said filter and a voltage source for applying multi-phase A.C. high voltage to said electrodes each time for short duration of time for elec-

trodynamically driving separated and accumulated dust particles in the form of a filter cake deposited in and on said filter, off the filter, a hopper formed at the bottom of said casing for collecting the electrodynamically drivenoff dust particles, and a dust-discharge valve positioned in said hopper.

3,945,814

APPARATUS FOR FEEDING PARTICLES OF GLASS INTO CRUCIBLES FOR EXTRUSION OF GLASS FILAMENTS

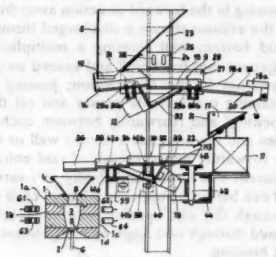
Heinz Keib, and Dieter Kahnke, both of Wertheim, Main, Germany, assignors to Glaswerk Schuller GmbH, Wertheim, Main, Germany

Filed May 28, 1974, Ser. No. 473,897

Claims priority, application Germany, May 26, 1973, 2326975

Int. Cl.² C03B *37/02*, *3/00*

U.S. Cl. 65—11 R 6 Claims



1. Apparatus for making glass filaments, comprising a crucible having an elongated open-top chamber for a charge of molten glass and orifices through which molten glass is extruded to form filaments; a source of substantially identical discrete solid particles in the form of glass tablets or groups of interconnected glass tablets; and means for transporting a stream of particles from said source to a position above said chamber so that the particles descend into the charge by gravity, comprising at least one elongated trough having a succession of sections which define an elongated path for the stream of particles and include a last section located immediately ahead of said chamber and a further section preceding said last section, all of said sections being inclined downwardly toward said chamber and said last section being inclined more steeply than said further section, the inclination of said last section being such that the particles sliding therein are accelerated one after the other and enter the charge in said chamber at timely spaced intervals, means for vibrating said trough to thereby advance the particles toward and beyond said last section, and means for moving said least section lengthwise of said chamber.

3,945,815

APPARATUS FOR DRAWING FIBERS BY FLUID MEANS

Warren H. D. Schmidt, Guelph, Canada, assignor to Fiberglas Canada Limited, Toronto, Canada

Continuation of Ser. No. 385,576, Aug. 3, 1973, abandoned, which is a division of Ser. No. 237,992, March 24, 1972, Pat. No. 3,773,483, which is a continuation of Ser. No. 35,197, May 6, 1970, abandoned. This application Aug. 15, 1974, Ser. No. 497,718

The portion of the term of this patent subsequent to Nov. 20, 1990, has been disclaimed.

Int. Cl.² C03B *37/02*

U.S. Cl. 65—12 12 Claims

1. Apparatus for drawing a continuous unbroken relatively thin fiber the thickness of which is of the order of 10/100,000 of an inch, said apparatus comprising:

a. means for supplying a heat softened stream of material;

b. a drawing funnel having an upstream section and a downstream elongated pulling section;

c. said funnel being positioned downstream from said supply to receive a fiber therefrom;

d. means to produce a laminar flow of a gas through said funnel including means for establishing a pressure differential over the length of the funnel;

e. said means for producing laminar flow further including an aerodynamically smoothly converging inlet for accelerating the laminar gas flow to establish a velocity exceeding the velocity of the continuous fiber, whereby the velocity differential causing said flow to remain laminar in said elongated pulling section generates a frictionally developed pulling force exerted on the fiber;

f. means for solidifying the drawn fiber comprising a spacing of the inlet portion of said funnel from the outlet portion of said means for supplying a heat softened stream by a distance of 5 to 15 inches, whereby said frictionally developed pulling force is exerted on a fully formed solidified portion of said fiber to attenuate said heat softened stream with the heat softened stream being free of said frictionally developed pulling force.

3,945,816

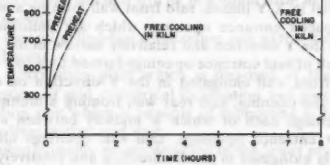
METHOD FOR FORMING A REFRACTORY CELLULAR PRODUCT

Jerry Dean Johnson, Van Nuys, Calif., assignor to Environ Control Products, Inc., Van Nuys, Calif.

Filed June 5, 1974, Ser. No. 476,666

Int. Cl.² C03B *5/18*, *19/00*; C03C *15/00*

U.S. Cl. 65—22 10 Claims



1. A method of forming a lightweight refractory foam substantially of silica comprising:

a. mechanically foaming a molten phase-separable alkali metal borosilicate glass having a borate content which separates into a silica-poor, borate-rich phase,

b. maintaining the temperature of the foamed glass between about 450°C and about 755°C to separate said glass into a silica-rich phase and a silica-poor, borate-rich, leachable phase,

c. cooling said glass below 450°C, and

d. leaching said foamed, phase-separated glass with an aqueous medium for a period sufficient to remove substantially all of said borate-rich phase to yield a lightweight refractory foam substantially of silica.

3,945,817

METHOD FOR THE COLLECTION OF DUST OF A HIGH ZINC CONTENT DURING THE PRODUCTION OF REDUCED IRON PELLETS

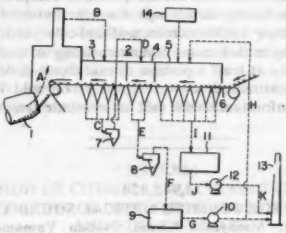
Kazuharu Yatsunami; Satoru Miyakado; Katsuaki Shiohara, all of Fukuyama, and Akira Honda, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1974, Ser. No. 525,953

Claims priority, application Japan, Dec. 17, 1973, 48-139693

Int. Cl.² C22B *1/16, 7/02*

U.S. Cl. 75—5 7 Claims



3. A method according to claim 1, wherein said exhaust gases are introduced to the respective zones in said pretreatment furnace at the upper portion of the respective zones, and are discharged from said respective zones from the lower portions thereof.

3,945,818

METHOD FOR ELECTROSLAG REMELTING WITH SLAG INTRODUCTION AND CURRENT CIRCUIT

Boris Evgenievich Paton, Kiev; Jury Vadimovich Latash, Kiev; Boris Izrailevich Medovar, Kiev; July Georgievich Emelianenko, Kiev, and Mikhail Markovich Kljuev, Elektrosal, all of U.S.S.R., assignors to Patent Management, Inc., Washington, D.C.

Division of Ser. No. 186,765, Oct. 5, 1971, and a continuation-in-part of Ser. Nos. 10,419, Feb. 11, 1970, abandoned, and Ser. No. 10,485, Feb. 11, 1970, abandoned, said Ser. No. 186,765, is a division of Ser. No. 68,661, Sept. 1, 1970, Pat. No. 3,736,124, which is a continuation-in-part of Ser. No. 592,054, Nov. 4, 1966, said Ser. No. 10,419, and Ser. No. 10,485, each is a continuation-in-part of said Ser. No. 592,054.

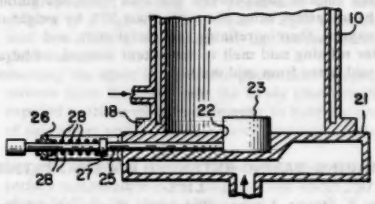
This application Nov. 13, 1974, Ser. No. 523,492

Claims priority, application Austria, Oct. 25, 1966, 9973/66; U.S.S.R., Mar. 5, 1966, 1060334; Apr. 2, 1966, 1067222

Int. Cl.² C22B *4/00;* H05B *3/00;* B22D *27/02*

U.S. Cl. 75—10 R 16 Claims

1. A method for starting up and supplying electric current to an ESR furnace comprised of a consumable electrode means, a mold, a bottom plate having a recess therein and an electric current source comprising the steps of placing a piece of metal in the recess in the bottom plate, controllably connecting at least the piece of metal and the electrode means to the electric current source, cooling the mold and bottom plate, establishing a molten slag pool in the lower end of the mold, bringing the consumable electrode means and the molten slag pool into contact, supplying electric current from the current source to the furnace for a period of time sufficient to allow the consumable electrode means to be remelted in the slag pool and to progressively resolidify the metal to form an ingot under the slag pool, integrating the piece of metal in the



bottom plate recess with the ingot being formed during the initial remelting, and continuing the remelting to form a complete ingot.

3,945,819

FERROUS METAL NETWORK IMPREGNATED WITH MAGNESIUM METAL

Jairaj Easwaran, Toledo, Ohio, and George S. Foerster, Hightstown, N.J., assignors to N L Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 454,951, March 26, 1974, Pat. No. 3,902,892, which is a continuation-in-part of Ser. No. 385,584, Aug. 3, 1973, abandoned. This application Oct. 15, 1974, Ser. No. 514,630

Int. Cl.² C21C *7/02;* B21C *1/00*

U.S. Cl. 75—53 4 Claims

4. Composition according to claim 2 in which the scrap pieces employed are scrap steel turnings.

3,945,820

PROCESS AND IMMERSION LANCES FOR INTRODUCING OXYGEN INTO A METAL MELT

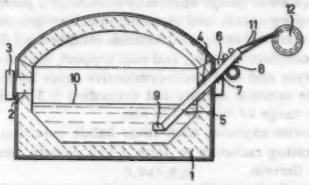
Karl Brotzmann, and Hans Georg Fassbinder, both of Sulzbach-Rosenberg, Germany, assignors to Eisenwerk-Gesellschaft Maximilianshutte mbH, Sulzbach-Rosenberg, Germany

Filed Mar. 1, 1974, Ser. No. 447,422

Claims priority, application Germany, Mar. 3, 1973, 2310776

Int. Cl.² C21C *5/34*

U.S. Cl. 75—60 7 Claims



1. A process for refining a molten metal melt in a hearth furnace by means of oxygen which comprises:

providing a movable lance supported for movement relative to said hearth furnace and movement into and out of said melt, said lance including a refractory sheath within which there are two concentric pipes, one of said pipes being a centrally located pipe for supplying oxygen to refine said melt and the second of said pipes being disposed around the oxygen pipe and being connected to a source of fluid hydrocarbon for protecting said lance from burning off when immersed in said metal melt;

moving said lance into said melt;
simultaneously blowing oxygen into said melt through said central pipe and hydrocarbon fluid into said melt through the annular gap between said two pipes, the amount of hydrocarbon being not more than 10% by weight of the oxygen, thereby refining said metal melt; and
after refining said melt to the extent desired, withdrawing said lance from said melt.

3,945,821

BEARING HAVING EXTENDED ROLLING FATIGUE LIFE

James P. Stroup, Ligonier Township, Westmoreland County, Pa., assignor to Latrobe Steel Company, Latrobe, Pa.

Filed June 24, 1974, Ser. No. 482,265
Int. Cl.[2] C22C *38/22, 38/24*
U.S. Cl. 75—126 C 2 Claims

1. A bearing part subject to rolling pressure and characterized by rolling fatigue life exceeding that of M50 steel by at least 2 times and formed from a steel consisting essentially of about 0.9 to 1.0% carbon, about 0.15 to 0.25% silicon, about 0.20 to 0.35% manganese, about 4.00 to 4.25% chromium, about 4.00 to 4.25% molybdenum, about 0.50 to 0.70% vanadium and the balance iron with usual impurities in ordinary amounts.

3,945,822

IMAGE INTENSIFICATION PROCESS

Karel Eugeen Verhille, Hoboken, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed June 8, 1973, Ser. No. 368,228
Claims priority, application United Kingdom, June 9, 1972, 27050/72
Int. Cl.[2] G03G *13/22*
U.S. Cl. 96—1 R 3 Claims

1. A method for intensifying low density silver images comprising the steps of:
1. providing a photographic material comprising a support coated on one side with at least one silver halide emulsion layer and on the opposite side with an electroconductive interlayer having a resistivity not higher than about 10^9 ohm.cm. and a conductivity at least 1000 times that of said support and is in turn coated with a photoconductive layer having a thickness of about 1–20 μm and consisting essentially of at least one organic photoconductive compound, each such silver halide emulsion layer yielding on exposure with actinic light a latent image which is reducible to a silver image upon treatment with a photographic developing agent, said electroconductive interlayer having a resistivity at least 1000 times smaller than that of the photoconductive layer, and said support, said conductive interlayer and said photoconductive layer having an aggregate spectral density not exceeding 0.3 in the wavelength range of 400 to 700 nm,
2. imagewise exposing such silver halide emulsion layer to penetrating radiation to form a low density latent silver image therein,
3. treating the latent silver image with a photographic developing agent to form a visible image thereof,
4. electrostatically charging the photoconductive layer,
5. exposing the electrostatically charged photoconductive layer through such developed emulsion layer containing said visible image to produce an electrostatic charge pattern according to said image,
6. developing the electrostatic charge pattern thus produced on the photoconductive layer with electrostatically attractable material, and
7. fixing of the electrostatically deposited material onto the photoconductive layer thereby to intensify said low density silver image.

3,945,823

ELECTROSTATOGRAPHIC REVERSAL DEVELOPMENT WITH DEVELOPER COMPRISING POLY(-xylylene)-COATED CARRIER PARTICLES

Richard A. Parent, Fairport, and H. Ronald Thomas, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 308,642, Nov. 21, 1972. This application July 19, 1973, Ser. No. 380,623
Int. Cl.[2] G03G *13/08, 13/22, 9/00*
U.S. Cl. 96—1 SD 9 Claims

1. An electrostatographic reversal development imaging process comprising the steps of providing an electrostatographic imaging member having a recording surface, forming an electrostatic latent image on said recording surface, and contacting said electrostatic latent image with a developer mixture comprising finely-divided toner particles electrostatically clinging to the surface of carrier particles capable of generating a negative triboelectric charge when mixed with said toner particles, said carrier particles comprising more core particles having an average diameter between about 1 micron and about 1,000 microns, and said core particles being surrounded by a thin outer layer consisting of poly(p-xylylene), whereby at least a portion of said finely-divided toner particles are attracted to and deposited on said recording surface in conformance with said electrostatic latent image.

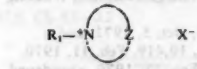
3,945,824

PROCESS FOR FORMING OPTICAL SOUND TRACK

Tadao Sakai; Masayoshi Kawai; Nobuo Yamamoto, and Masakazu Yoneyama, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 5, 1974, Ser. No. 494,931
Claims priority, application Japan, Aug. 3, 1973, 48-87727
Int. Cl.[2] G03C *7/24, 7/16, 5/32, 5/30*
U.S. Cl. 96—4 22 Claims

1. A process for forming an optical sound track which consists essentially of applying a nitrogen containing heterocyclic compound in which at least one of the nitrogen atoms is connected to a group having 6 or more carbon atoms to form a quaternary salt to a sound track area of a multi-layer color photographic material, after color developing but prior to bleaching wherein said nitrogen containing heterocyclic compound is represented by the general formula:



wherein Z represents the atoms necessary to form a pyridine ring, an imidazole ring or a quinoline ring; X^- represent an anion; R_1 represents a group having 6 or more carbon atoms and is selected from the group consisting of

a. an alkyl or an alkenyl group,

(b) $R_2—A—CH_2CHCH_2—$, (OH)

(c) $R_2—B—CH—$, and (R_3)

(d) $R_2—A—(C)_m—(D)_n—(CH_2CHCH_2)_p—$ (OH)

wherein R_2 represents an alkyl group, an alkenyl group, or an alkylaryl group; R_3 represents a hydrogen atom or a methyl group; A represents —O—, —S—, —COO—, or $—NCH_3—$; B represents —O—, —COO—, —CONH—, or $—CONHC_4H_4CONH—$; C represents an oxyalkylene group; D represents $—CH_2CH_2—$ or —O—; m represents an integer of 1 to 40; n represents 0 or 1; and p represents 0 or 1.

3,945,825

METHOD FOR PRODUCING WIDTH-MODULATED SURFACE RELIEF PATTERNS

Michael Thomas Gale, Gattikon, Switzerland, and Arthur Herbert Firester, Skillman, N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 22, 1974, Ser. No. 472,436
Int. Cl.² G03C 5/04; G02B 3/00
U.S. Cl. 96—27 H 12 Claims

1. A method for producing a width-modulated surface relief pattern in the surface of a substrate that is covered with a coating of substantially uniform thickness of photoresist, said method comprising the steps of:

a. exposing the photoresist to surface radiation including an interference pattern,

b. developing the exposed photoresist just sufficiently to produce an amplitude-modulated surface relief pattern which reveals only certain portions of the surface of the substrate as a function of the spatial distribution of the relative intensity of said surface radiation,

c. etching only the revealed certain portions of said substrate to form a width-modulated wave grating of substantially rectangular cross section and substantially uniform depth in the substrate, and

d. only then removing the photoresist from the now-revealed remainder of the substrate.

3,945,826

METHOD OF CHEMICAL MACHINING UTILIZING SAME COATING OF POSITIVE PHOTORESIST TO ETCH AND ELECTROPLATE

Howard Friedman, 9321 W. Menard, Morton Grove, Ill. 60053; David W. Levinson, 1362 Lee Road, Northbrook, Ill. 60062, and Morris H. Millman, 8737 Keeler, Skokie, Ill. 60076

Continuation of Ser. No. 244,162, April 14, 1972, abandoned. This application June 17, 1974, Ser. No. 480,247
Int. Cl.² G03C 5/00; B29C 17/08
U.S. Cl. 96—36 9 Claims

1. The method of chemical machining a sheet of sheet metal to define one or more components that have their marginal edgings formed by voids formed in the sheet but which remain integrally connected in the sheet for handling purposes, which method is to include the plating of a precious metal on selected portions of one or more of said components on restricted areas of same, said method comprising:

taking the sheet and degreasing same,

chemically cleaning the sheet,

rinsing the sheet with deionized water and drying the sheet,

passing the dried sheet through a liquid positive photoresist to provide each side of the sheet with a positive photoresist coating of uniform thickness across the sheet,

curing the photoresist coatings to make same photosensitive,

placing the sheet between a set of photomasks bearing registered images of the front and back side of the metal components to be formed, respectively,

photographically exposing said images to a high intensity light source to transfer the respective images to the respective coatings in registered relation by exposure of same to said light source through the respective photomasks,

immersing the sheet in a positive photoresist developer to remove from the sheet only those portions of said coatings that were photographically exposed by the exposing step to bare the portions of said sheet underlying said photographically exposed portions of said coatings,

etching the sheet on both sides of same to remove the bared portions of said sheet through the thickness of said sheet to form the sheet voids that define said components,

rinsing and drying the etched sheet,

applying to the etched sheet in registered relation thereto and in overlying registered relation to one of the coatings a photomask bearing an image delineating for exposure one or more selected areas of the etched sheet where selective plating of a precious metal is desired,

photographically exposing the photomask and said one coating to a high intensity source of light to transfer to said one coating the image of the second mentioned photomask,

immersing the sheet in a positive photoresist developer to remove from the sheet only the newly photographically exposed portions of the one coating to bare the portions of said sheet underlying said newly exposed portions of said coating,

baking the sheet and coatings under conditions providing a surface temperature in the range of from about 250° F. to about 300° F. for about 10 minutes,

cleaning the sheet in an acidic bath for plating purposes,

electroplating, in an electrolyte bath of the type to which said coatings remain plating resistant, the newly bared sheet portions with the precious metal to the exclusion of the sheet portions still bearing said coatings,

and thereafter removing the remainder of the photoresist coatings.

3,945,827

METHODS OF MAKING PRINTED CIRCUIT BOARDS UTILIZING AN IMAGE TRANSPARENCY MODE WITH HERSCHEL-EFFECT FILM

Barry David Brown, P.O. Box 192, Sparks, Nev. 89431

Filed Aug. 2, 1974, Ser. No. 494,043
Int. Cl.² G03C 5/00, 5/32
U.S. Cl. 96—36.2 8 Claims

1. In the method of producing a printed circuit board by preparing a film negative of the desired printed circuit, assembling the film negative to a photosensitive coating on a copper-clad laminate, exposing the coating to light through the negative, developing the coating to produce bare and resist-coated areas, and etching away the bare areas of the copper-clad laminate, the improvement in the preparation of the film negative which comprises the steps of applying a first Herschel-Effect silver halide emulsion film to a graphic image of the desired printed circuit, exposing and developing the first film so as to yield a film copy of the graphic image, applying a second Herschel-Effect silver halide emulsion film to said film copy of the graphic image, and exposing and developing the second film, one of said films being initially fogged when it is exposed so as to yield a positive replica of the image to which it is exposed, the other of the films being initially unfogged when it is exposed and developed so as to yield a negative replica of the image to which it is exposed.

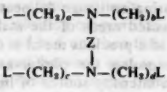
3,945,828

ACTIVATION OF SILVER HALIDE PHOTOGRAPHIC DEVELOPERS

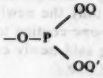
Haruhiko Iwano, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jan. 24, 1973, Ser. No. 326,227
Claims priority, application Japan, Jan. 29, 1972, 47-10666
Int. Cl.² G03C 5/26, 5/30
U.S. Cl. 96—66 R 10 Claims

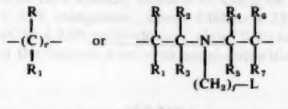
1. A method of activating a photographic developer of reduced activity which contains a lower valence metal capable of reducing exposed silver halide as a developing agent, said metal being present in combination with a ligand, which forms a complex with the metal, of the following formula:



wherein L is —COOM or



M is H, Na, K, Li, NH_4 or a substituted ammonium group such as a trialkanol or trialkyl ammonium group where the alkanol or alkyl group has 1 to 4 carbon atoms; Q and Q′ are H, Na, K, Li, NH_4, a substituted ammonium group such as a trialkanol or trialkyl ammonium group where the alkanol or alkyl group has 1 to 4 carbon atoms or aralkyl; *a*, *b*, *c* and *d* are 1, 2, or 3; Z is a divalent group such as a phenylene group, a cyclohexyl group,



wherein L is described above; R, R_1, R_2, R_3, R_4, R_5, R_6 and R_7 are H, OH, NH_2, a substituted amino group such as a $C_1 - C_4$ trialkanol or trialkyl amine, halogen, alkyl or alkoxy having 1–4 carbon atoms; *f* is 0, 1, 2 or 3; *e* is 1, 2 or 3; said developing agent initially being present in an amount sufficient to reduce exposed silver halide, said method comprising contacting said photograhic developer with a metal the same as the metal of the developing agent and having a large contact area.

3,945,829

COLOR PHOTOGRAPHIC MULTILAYER MATERIAL WITH IMPROVED COLOR DENSITY

Hugo Zorn, Munich-Lochhausen; Karl Küffner, Unterhaching; Hans Glockner, Munich, all of Germany; Jozef Frans Willems, Wilrijk, and Robrecht Julius Thiers, Brasschaat, both of Belgium, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed July 15, 1974, Ser. No. 488,438

Claims priority, application Germany, July 19, 1973, 2336721

Int. Cl.² G03C *1/84, 1/76, 1/34, 1/02*

U.S. Cl. 96—74 **5 Claims**

1. A color photographic multi-layer material having compounds that produce an image by image-wise exposure followed by developing treatment producing an image comprising at least two spectrally sensitized silver halide emulsion layers each containing a color coupler and at least one other layer containing a binder and colloidal silver, wherein the improvement comprises the binder and colloidal silver layer contains a non-diffusible heterocyclic mercapto compound carrying a substituent consisting of an aliphatic hydrocarbon group having 8 to 20 carbon atoms and a mercapto group on a ring carbon atom of a 5- or 6- membered heterocyclic ring, said heterocyclic mercapto compound being in an amount of 0.1 to 1 g per g of colloidal silver.

3,945,830

DRY PRE-SENSITIZED AZIDE AND SILICONE RUBBER CONTAINING PLANOGRAPHIC PLATES AND METHODS OF PREPARATION

Kenichiro Yazawa; Shinzo Kishimoto; Shizuo Miyano, and Asaji Kondo, all of Asaki, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 20, 1973, Ser. No. 426,751

Claims priority, application Japan, Dec. 20, 1972, 47-127998

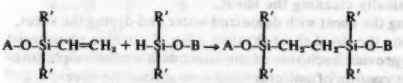
Int. Cl.² G03C *1/72, 1/54;* G03F *7/08*

U.S. Cl. 96—75 **14 Claims**

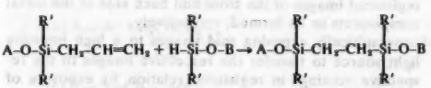
1. A dry presensitized positive-working planographic plate comprising a support having an ink receptive surface and having coated thereon one or two layers of (a) a silicone gum selected from the group consisting of a single package-type silicone gum, a two package-type silicone gum and a mixture thereof, (b) a photosensitive azide compound, (c) a cyclized rubber, and (d) a copolymer of vinylidene chloride and acrylonitrile wherein the molar ratio of vinylidene chloride:acrylonitrile is about 70:30 to 91:9, the uppermost layer, when said planographic plate has two layers, containing at least said components (a) and (b) and the lower layer containing at least said component (c), said components (a), (b), (c) and (d) being in a homogeneous mixture when present in a single layer, and said componets (a), (b) and (d) being present in a homogeneous mixture when present in a single layer, and said components (a) and (b) being present in a homogeneous mixture when present in a single layer, said single package-type silicone gum being a linear compound having repeating units of the following formula:

n = 2 – 2000

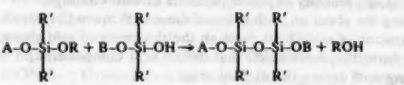
wherein R′, which can be the same or different, is a monovalent alkyl group, a monovalent aryl group or a cyanoaryl group, said linear compound being terminated by acetyl, oxime, alkyl or amino groups said two package-type silicone gum being a condensation type or an addition type silicone gum, said two package addition reaction type silicone gum being formed from the following reaction (A)



or the following reaction (B)



wherein A and B represent organosiloxane residues and R′ is a monovalent alkyl group, a monovalent aryl group or a cyanoaryl group; and the two package-type silicone condensation type gum being formed by the following reaction scheme



wherein R′, A, and B are as defined in this claim and R is a 1 to 3 carbon alkyl group, in the case of (a), (b), (c) and (d)

being in a single layer, the amounts of (a), (b), (c) and (d) corresponding to the application of a coating at a rate of 3 to 10 g/1000 cm² of a mixture prepared by dissolving uniformly in 200 to 400 parts by weight of a solvent 1 to 5 parts by weight of a solution prepared by dissolving 3 grams of (c) in 100 ml of a solvent, 1 to 5 parts by weight of (b), 1 to 2 parts by weight of (d) and 10 to 30 parts by weight of (a), in the case of said planographic plate having two layers, (a), (b), (c) and (d) are present in amounts corresponding to applying the following coatings:

A. In the case of a coating of (c) and (d), the application of 1 to 4 g/1000 cm² of a mixture of 90 to 95 parts by weight of a solution of (c) and 10 to 15 parts by weight of a solution of (d);

B. In the case of a coating of (b) and (a), 3 to 10 g/1000 cm² of a mixture of 2 to 5 parts by weight of (b), 2 to 10 parts by weight of a single package-type silicone gum (a) and 15 to 30 parts by weight of a two package-type silicone gum (a) in 300 to 400 parts by weight of solvent;

C. In the case of coating containing (a) and (b) and (d), the above formulation B further containing 1 to 3 parts by weight of (d),

said silicone gum being vulcanized into silicone rubber after application to said support.

3,945,831

PHOTOSENSITIVE RESINS CONTAINING A THIENYLACRYLIC ACID ESTER OR AMIDE GROUP

Masato Satomura, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

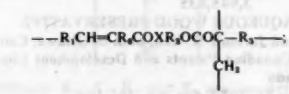
Filed Jan. 2, 1974, Ser. No. 430,123

Claims priority, application Japan, Dec. 29, 1972, 48-2539

Int. Cl.² G03C *1/68, 5/00*

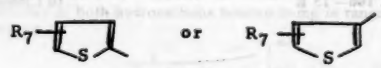
U.S. Cl. 96—86 P **25 Claims**

1. A photosensitive composition comprising as the main photosensitive component a high molecular weight polymer containing monomer units of the following general formula:

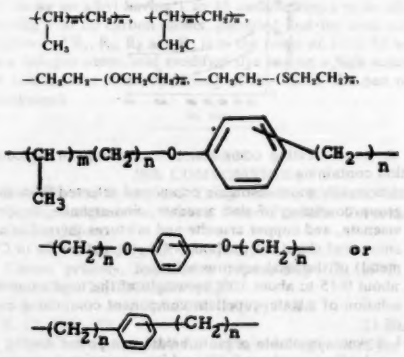


wherein

R_1 is



R_2 is



R_3 is a hydrogen atom or a methyl group;

R_4 is $-CH_2)_m$;

m is 0 or 1;

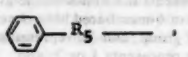
n is 1, 2, 3 or 4;

X is —O—, —S—, —NH— or —NR_8—;

R_6 is a hydrogen atom, $H+CH_2)_n$, is cyano group or a carbamoyl group;

R_7 is a hydrogen atom, a chlorine atom, a bromine atom, $H+CH_2)_n$, $H+CH_2)_nO$—, a nitro group, a sulfo group, a carboxy group, a cyano group, a phenyl group, a phenoxy group, an acetyl group or a benzoyl group; and

R_8 is $H+CH_2)_n$ or



said polymer containing functional groups attached to the polymer chain of said polymer directly as a pendant group or through a divalent group, said functional group being selected from the group consisting of a thienylacrylate functional group, a thienylacrylamide functional group, a thienylthioacrylate functional group and a thienyl thioacrylamide functional group and

at least one sensitizer.

3,945,832

FOGGED, DIRECT-POSITIVE SILVER HALIDE EMULSION CONTAINING DESENSITIZERS AND A DIMETHINE OPTICAL SENSITIZING DYE

Keisuke Shiba; Masanao Hinata; Reiichi Ohi, and Tadao Shishido, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 27, 1974, Ser. No. 455,095

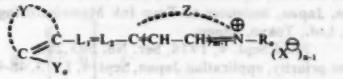
Claims priority, application Japan, Mar. 27, 1973, 48-35376

Int. Cl.³ G03C *1/36, 1/28, 1/02*

U.S. Cl. 96—100 **14 Claims**

1. A fogged direct positive silver halide photographic emulsion containing

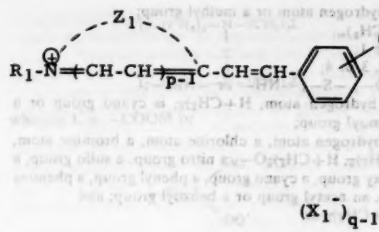
1. at least one dimethine dye having the general formula (I):



(I)

wherein Y represents a non-metallic atom group necessary to complete a heterocyclic nucleus selected from the group consisting of a pyrole nucleus, an indole nucleus, a pyrazolo quinazolone nucleus, or a pyrazolo benzimidazole nucleus; Y_a represents a hydrogen atom, an alkyl group, an aryl group, a carboxyl group, an alkoxy group, an alkoxycarbonyl group, a hydroxyl group, or halogen atom Z represents a nonmetallic atom group necessary to complete a 5- or 6-membered heterocyclic ring; L_1 and L_2 represents a methine group, and R_a represents an alkyl group or an aryl group; m and n represents 1 to 2, and X represents an anion;

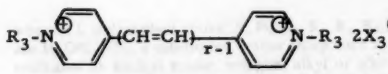
2. at least one compound having the general formula (II):



wherein Z_1 represents the non-metallic atoms necessary to complete a 5- or 6-membered heterocyclic ring; R_1 represents an alkyl group, and X_1 represents an anion; and a, p, and q each represents 1 or 2; and

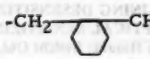
3. at least one compound having the general formula (III):

or the general formula (IV):



wherein Y_1 and Y_2, which can be the same or different each represents the non-metallic atoms necessary to complete a pyridine, benzothiazole or benzimidazole nucleus; or Y_1 and Y_2 may combine together to complete a 1,10-phenenthroline ring;

R_2 represents $-CH_2)_m$, in which m_1 is an integer of from 2 to 4), —CH=CH—, or



R_3 represents an alkyl group, r represents 1 or 2, and X_2 and X_3 each represents an anion.

3,945,833

PHOTOSENSITIVE COATING COMPOSITION

Masujiro Sumita; Ryozo Konno, and Toru Takeuchi, all of Tokyo, Japan, assignors to Toyo Ink Manufacturing Company, Ltd., Tokyo, Japan

Filed Sept. 4, 1974, Ser. No. 503,206

Claims priority, application Japan, Sept. 4, 1973, 48-98885

Int. Cl.² G03C *1/70*

U.S. Cl. 96—115 R **7 Claims**

1. A photosensitive coating composition comprising

1. a prepolymer containing radically cross-linkable ethylenically unsaturated double bonds, and
2. a sensitizer which comprises a mixture of (a) a halogenated benzophenone (b) 4,4'-bis(diethylamino)benzophenone in a weight ratio of (a) to (b) of about 1:2 to 10:1.

6. The photosensitive coating composition of claim 1, wherein said composition is a printing ink and additionally includes a pigment and at least one of a wax, a stabilizer and a monomer diluent and wherein said sensitizer is present in an amount of about 5 to 25% by weight based on the total weight of the printing ink composition.

3,945,834

AQUEOUS COMPOSITIONS FOR LUMBER TREATMENT

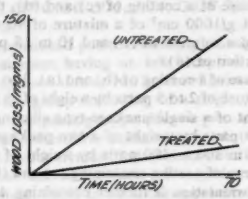
Michael R. Clarke, and Raman Desai, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed May 2, 1973, Ser. No. 356,355

Claims priority, application Canada, Sept. 1, 1972, 150792

Int. Cl.² B27K *3/32, 3/52;* C09D *5/14*

U.S. Cl. 106—15 R **10 Claims**



1. A treating composition comprising an aqueous solution containing:

a. a zinc compound, selected from the group consisting of zinc carbonate, zinc oxide and zinc thiocyanate, in a total amount, in the solution, of about 0.5 to about 10% by weight, as zinc;

b. an ammonium composition consisting essentially of ammonium thiocyanate and ammonium carbonate, in an amount of about 1 to about 28% by weight, with the mole ratio calculated as $[NH_4CNS + (NH_4)_2CO_3]/ZnO$ being from about 1 to about 3; and

c. ammonia, in an amount of about 0.3 to about 28%, sufficient to provide a ratio of ammonia to zinc of from at least about 0.3 up to about 1, the composition having a pH of 9 or more.

3,945,835

HEAVY DUTY AQUEOUS WOOD PRESERVATIVE

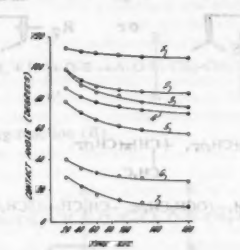
Michael R. Clarke, and Jaromir R. Rak, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed May 21, 1973, Ser. No. 362,104

Claims priority, application Canada, Dec. 12, 1972, 158685

Int. Cl.² C09D *5/14*

U.S. Cl. 106—15 R **10 Claims**



1. A wood treating composition comprising an aqueous solution containing:

a. a normally water-insoluble compound selected from the group consisting of zinc arsenate, zinc arsenite, copper arsenate, and copper arsenite and mixtures thereof in an amount of about 0.1 to about 4% by weight (as Zn or Cu metal) of the total aqueous solution;

b. about 0.15 to about 10% by weight of the total aqueous solution of a water-repellent component comprising one of

i. a water-insoluble organic acidic compound having a solubility ≥ about 0.2% and in concentrated aqueous

ammonia, said water-insoluble organic acidic compound being selected from the group consisting of acid esters of phosphoric acid with monohydric alcohols and having an acid value between about 200 and about 500, and mixtures thereof, in an amount of about 0 to about 200% of the zinc or copper, or

ii. a combination of said selected organic acidic compound and a carbonate or bicarbonate ion selected from the group consisting of zinc carbonate, zinc bicarbonate, copper carbonate and copper bicarbonate in an amount of about 0 to about 150% of the zinc or copper; and

c. ammonia, in an amount of about 1 to about 28% by weight of the total aqueous solution; the ammonia being sufficient to solubilize said normally water-insoluble salt of zinc or copper and said normally water-insoluble water-repellent compound.

3,945,836

INK COMPOSITION

Fumio Miyata, Kyoto, Japan, assignor to Sakura Color Products Corporation, Osaka, Japan

Filed Apr. 5, 1973, Ser. No. 348,050

Claims priority, application Japan, Apr. 10, 1972, 47-36282

Int. Cl.[2] C08L *93/04*; C09D *11/08, 11/16*

U.S. Cl. 106—22 **4 Claims**

1. An ink composition for a marking pen consisting of a substantially odorless and nontoxic aliphatic hydrocarbon solvent having dissolved therein 5 to 35% by weight of a resinous binder in the form of a rosin derivative and 5 to 20% by weight of a modified dye, all % weights being based on the weight of the composition, said modified dye being a reaction product obtained by reacting (a) an anthraquinone dye having at least one group of $-CO_2M$ and $-SO_3M$ in the molecule wherein M is an alkali metal with (b) an organic ammonium compound represented by the formula

(I)

wherein R_1, R_2, R_3 and R_4 are respectively a hydrocarbon radical having 1 to 40 carbon atoms, a radical of a hydrocarbon bonded to a hydrocarbon by a divalent group of —O—, —S—, —COO—, —CONH— or —NH—, the total carbon number of both hydrocarbons bonded being in range of 2 to 40, or

R′ being an alkyl having 1 to 15 carbon atoms or an alkenyl having 1 to 20 carbon atoms, provided that the total carbon number of R_1, R_2, R_3 and R_4 is in the range of 11 to 55 and X is a halogen atom, said modified dye having a high solubility in said solvent whereby drying of the ink in the pen nib is minimized.

3,945,837

INK COMPOSITION

Fumio Miyata, Kyoto, and Yasuji Okuda, Hirakata, both of Japan, assignors to Sakura Color Products Corporation, Osaka, Japan

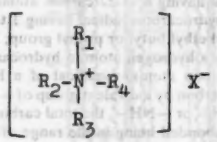
Filed July 12, 1973, Ser. No. 378,389

Claims priority, application Japan, July 15, 1972, 47-71144; Sept. 28, 1972, 47-97828

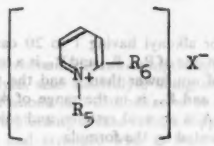
Int. Cl.[2] C09D *11/02, 11/08*

U.S. Cl. 106—22 **24 Claims**

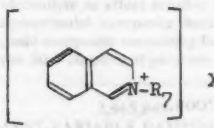
1. In an ink composition for use in marking pens of the type composed of a dye, a binder and a solvent, the improvement which comprises the solvent being selected from the group consisting of the hexane series and having dissolved therein 5 to 35% by weight of the resinous binder and about 5 to 20% by weight of a modified dye, all % weights being based on the weight of the total composition, said modified dye being at least one species selected from the group consisting of a reaction product obtained by reacting a disazo or anthraquinone dye having at least one group of $-CO_2M$ and $-SO_3M$ in the molecule wherein M is an alkali metal with an organic ammonium compound and a reaction product obtained by reacting a basic dye having a positively charged nitrogen, sulfur or oxygen atom in the molecular selected from the group consisting of azo, diphenylmethane, triarylmethane, xanthene, acridiene, methine or polymethine, thiazole, azine, oxazine, thiazine, quinoline and authraquinone dyes with an acid compound: said ammonium compound being represented by the formula



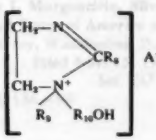
)



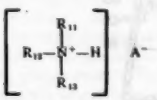
,



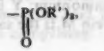
,



or



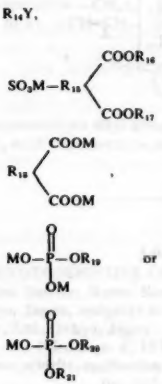
wherein R_1, R_2, R_3 and R_4 are respectively a saturated or unsaturated hydrocarbon radical having 1 to 40 carbon atoms, a radical of a saturated or unsaturated hydrocarbon bonded to a saturated or unsaturated hydrocarbon by a divalent group of —O—, —S—, —COO—, —CONH— or —NH—, the total carbon number of both hydrocarbons bonded being in the range of 2 to 40, or



R' being an alkyl or alkenyl having 1 to 20 carbon atoms, provided that at least one of R_1, R_2, R_3 and R_4 has a carbon number of not lower than 4 and the total carbon number of R_1, R_2, R_3 and R_4 is in the range of 7 to 55; R_5 is a saturated or unsaturated hydrocarbon radical having 4 to 40 carbon atoms, a radical of a saturated or unsaturated hydrocarbon bonded to a saturated or unsaturated hydrocarbon by a divalent group of —O—, —S—, —COO—, —CONH— or —NH—, the total carbon number of both hydrocarbons bonded being in the range of 4 to 40, or

R' being an alkyl or alkenyl having 4 to 20 carbon atoms; R_6 is hydrogen atom, methyl or ethyl group; R_7 is an aliphatic hydrocarbon radical having 4 to 22 carbon atoms; R_8 and R_9 are respectively a hydrocarbon radical having 1 to 10 carbon atoms; R_{10} is methyl ethyl butyl or propyl group; R_{11}, R_{12} and R_{13} are respectively a hydrogen atom, a hydrocarbon radical having 1 to 40 carbon atoms, a radical of a hydrocarbon bonded to a hydrocarbon by a divalent group of —O—, —S—, —COO—, —CONH— or —NH—, the total carbon number of both hydrocarbons bonded being in the range of 2 to 40, or

R' being an alkyl or alkenyl having 1 to 20 carbon atoms, provided that at least one of R_{11}, R_{12} and R_{13} is a radical having a carbon number of not lower than 4 and the total carbon number of R_{11}, R_{12} and R_{13} is in the range of 4 to 50; X is halogen atom and; A is an acid residue; and said acid compound being represented by the formula



wherein R_{14} and R_{19} are respectively a saturated or unsaturated aliphatic hydrocarbon radical having 7 to 22 carbon atoms, an aromatic hydrocabon radical having 10 to 28 carbon atoms or a saturated or unsaturated alicyclic hydrocarbon radical having 10 to 28 carbon atoms; R_{15} is a saturated aliphatic hydrocarbon radical having 2 to 14 carbon atoms; R_{16}, R_{17}, R_{20} and R_{21} are respectively a saturated or unsaturated aliphatic hydrocarbon radical having 4 to 22 carbon atoms; R_{18} is a saturated aliphatic hydrocarbon radical having 4 to 18 carbon atoms; M is an alkali metal or ammonium; Y is a —CO_2M, —SO_3M or —OSO_3M group wherein M is the same as above.

3,945,838

GLASS COMPOSITIONS AND THEIR FIBERS

Thomas D. Erickson, Newark, and Warren W. Wolf, Reynoldsburg, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 12, 1974, Ser. No. 496,485

Int. Cl.² C03C 13/00

U.S. Cl. 106—50 12 Claims

1. A fiberizable, boron and fluorine free glass composition having a liquidus temperature of 2200° F or less, having a viscosity of log 2.5 poises at 2450° F or less and having an index of refraction of about 1.550 in the fiber form, consisting essentially by weight of:

Ingredients	Weight Percent
SiO_2	66.0 to 67.0
CaO	10.0 to 11.0
Na_2O	14.5 to 15.5
ZrO_2	7.5 to 8.5.

3,945,839

ALUMINA REFRACTORY

Edward L. Manigault, Cincinnati, Ohio, assignor to N L Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 402,403, Oct. 1, 1973, abandoned. This application Oct. 3, 1974, Ser. No. 511,795

Int. Cl.² C04B 35/10, 35/42

U.S. Cl. 106—66 7 Claims

1. A refractory composition comprising from 70% to 96% alumina, from 3% to 20% iron chromite ore, and from 1% to 10% of a compound selected from the group consisting of phosphoric acid and aluminum phosphate, said compound calculated as P_2O_5, all of the percentages expressed on a weight basis.

3,945,840

NON-COMBUSTIBLE MOLDING MATERIAL

Harutoshi Ueda, Osaka; Naoyuki Suzuki, Nara, and Masami Nagao, Takatsuki, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 183,077, Sept. 23, 1971, abandoned. This application Oct. 15, 1973, Ser. No. 406,611

Claims priority, application Japan, Sept. 24, 1970, 45-84199; Sept. 24, 1970, 45-84200; Sept. 25, 1970, 45-84468; Oct. 22, 1970, 45-93221; Nov. 16, 1970, 45-101231; Dec. 28, 1970, 46-126941; Dec. 29, 1970, 46-124120

Int. Cl.² C04B 7/32, 7/34, 21/02

U.S. Cl. 106—87 13 Claims

1. A non-combustible molding composition which is capable of hardening after being dehydrated to a moisture content of 5 to 50 percent by weight comprising:

a. 100 parts by weight of a hydraulic inorganic mixture consisting of an inorganic substance composed predominantly of silica selected from the group consisting of quartz rock, silica sand, aplite, pottery stone, silicate terra alba, diaspore, diatomaceous earth, fly ash, perlite, obsidian perlite, pumice microballoon, foamed shale pumice, foamed clay and vermiculite; and an inorganic substance composed predominantly of a source of calcium oxide selected from the group consisting of slaked lime, quick lime and calcium carbonate, the molar ratio of the inorganic substance composed predominantly of a source of calcium oxide to the inorganic substance composed predominantly of silica being from 0.1 to 1.2;

b. 10 to 200 parts by weight of mineral fibers selected from chrysotile asbestos, amosite asbestos, crocidolite asbestos, amphibole asbestos, tremolite asbestos, actinolite asbestos, rock wool, glass fiber and slag wool; and

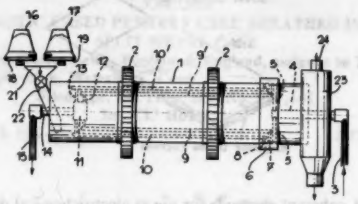
c. 1 to 15 parts by weight of crystalline aluminum oxide.

3,945,841

PROCESS FOR OBTAINING A BUILDING MATERIAL COMPRISING HYDRATED LIME AND PLASTER

Philippe A. Dumont, Stockay, Belgium, assignor to Carrieres Et Fours A Chaux Dumont-Wautier, Belgium

Filed May 29, 1973, Ser. No. 364,932
Claims priority, application United Kingdom, June 5, 1972, 26050/72
The portion of the term of this patent subsequent to Aug. 6, 1991, has been disclaimed.
Int. Cl.² C04B 11/00
U.S. Cl. 106—109 5 Claims



1. A process for producing a building material from plaster or hemihydrated calcium sulphate and hydrated lime or calcium hydroxide in dry and powdery condition, comprising reacting phosphogypsum, a by-product obtained during the manufacture of phosphoric acid, and quicklime both in pulverulent state in proportions suitable for obtaining a mixture containing 1 to 9 parts by weight of plaster to 1 part by weight of hydrated lime; supplying part of the heat needed for the conversion of gypsum into plaster by the exothermic reaction of hydration of the quicklime; and also effecting indirect heating of the reaction mixture.

3,945,842

CAST-FORMING COMPOSITION

Percy Green, Highland Park, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Aug. 13, 1973, Ser. No. 387,867
Int. Cl.² C04B 11/14
U.S. Cl. 106—111 6 Claims

1. In a composition for forming orthopedic casts and comprising a settable, water-wettable gypsum cement cast-forming composition, the improvement wherein said composition comprises a quarternary ammonium compound having bacteriostatic, wetting and accelerator properties, said quarternary ammonium compound selected from the group consisting of benzalkonium halides and cetyl-trimethyl-ammonium halides and being present in an amount of at least about 0.025% by weight based on the weight of the settable composition and less than that which would cause foaming.

3,945,843

ACRYLIC ACID COPOLYMER AS PIGMENT DISPERSANT

David W. Holty, and George E. Lauterbach, both of Naperville, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed July 22, 1974, Ser. No. 490,628
Int. Cl.² C09C 3/00, 1/02
U.S. Cl. 106—308 M 8 Claims

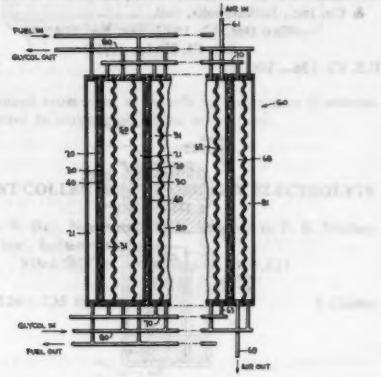
1. An improved method for rapidly dispersing high solids suspensions having from 50–80% by weight of soilds which comprises adding from 0.2–1.4% by weight of a dispersant formed by the copolymerization of methyl acrylate and acrylic acid to said high solids suspensions wherein the weight ratio of methyl acrylate to acrylic acid is from 15:85 to 30:70.

3,945,844

ELECTROCHEMICAL CELL

Richard C. Nickols, Jr., South Windsor, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 18, 1971, Ser. No. 172,655
Int. Cl.² H01M 2/00, 8/02
U.S. Cl. 136—86 R 10 Claims



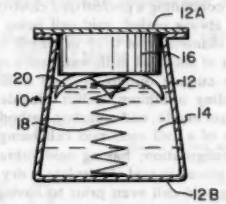
1. An electrochemical cell comprising an anode, cathode, and electrolyte, said electrolyte being in ionic contact with each of said anode and cathode, and as an essential part of said cell, or a plurality of said cells, a support or coolant plate constructed and arranged with at least one of said anode, cathode, or electrolyte to effect sensible heat transfer, comprising a polymer/metal composite having a high thermal conductivity, said composite containing from 50 – 80 percent metal and from 50 – 20 percent polymer.

3,945,845

DISPLACEMENT-VARIABLE DAMPING FOR DASH-POT TYPE ELECTROLYTE AMPULE

Melvyn I. Morganstein, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 15, 1974, Ser. No. 524,283
Int. Cl.² H01M 6/30
U.S. Cl. 136—90 11 Claims



1. In an ampule for a deferred action battery including a container with a fluid electrolyte therein, said container having a piston mounted therein and resilient means for normally holding said piston at a first end of said container, means on one end of said piston for puncturing a second end of said container which is opposite said first end, whereby said container, resilient means, electrolyte, and piston form dashpot means for generating a damping force in opposition to the movement of said piston, the improvement in said dashpot means comprising:

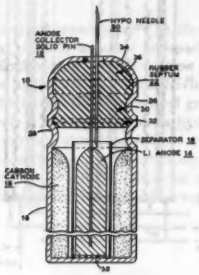
an annular orifice defined by said piston and the walls of said container which increases from a minimum size at said first end of said container to a maximum size at said second end of said container.

3,945,846

MINIATURE CONCENTRIC BATTERY

Arabinda N. Dey, Needham, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Dec. 12, 1972, Ser. No. 314,316
Int. Cl. H01m *17/00*
U.S. Cl. 136—100 R 7 Claims



1. A primary electric cell, comprising
an elongated cylindrical metallic container can;
a layer of carbonaceous cathodic material on the cylindrical inner surface of said can to serve as a cathode;
means including a linear metal hypodermic needle element sealed at its outer end disposed axially within said can to serve as an anode support and current collector, and said means also providing a conduit for injecting a liquid electrolyte into the cell during manufacturing assembly;
a layer of lithium metal supported on the outside surface of said linear metal element to serve as an anode;
a cylindrical separator of electrically insulating material between said anode and cathode;
an insulating sealing element supported on and at the top end of said can, with said linear element extending through and insulatingly supported by said sealing element to serve as an anode collector;
and a predetermined quantity of liquid electrolyte in said cell.

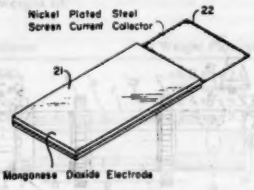
5. A cylindrical concentric miniature organic electrochemical cell containing a pressurized electrolyte while having its open end always sealed, said cell being extremely small, about 0.1 in diameter and 0.75 in length but having a high energy output of about 24 milli-watt hours at about 2–3 volts, and having a current output of 2—3 milli-amps.; said cell further including a lithium, sulfur dioxide electrolyte and having a lithium anode, and a carbon cathode which is on the inner surface of a cell can, said cell being of a cylindrical aluminum configuration, having said lithium anode axially disposed and placed in said electrolyte, a dry seal compression means closing said cell even prior to having said electrolyte included therein so as to maintain proper restraint, said compression means being a rubber septum radially crimped and clamped at the open end of said aluminum cell can, said crimp being obtained by means of a pair of inwardly directed beads; said septum also being compressed downwardly by a peening means on the upper surface of said septum; and a plastic disc resting at the bottom of said can to insulate said anode from said cell can said cell including a linear metal hypodermic needle element sealed at its outer end disposed axially within said can to serve as an anode support and current collector, and also providing a conduit for injecting liquid electrolyte into the cell during manufacture assembly.

3,945,847

COHERENT MANGANESE DIOXIDE ELECTRODES, PROCESS FOR THEIR PRODUCTION, AND ELECTROCHEMICAL CELLS UTILIZING THEM

Karl V. Kordesch, Lakewood, and Akiya Kozawa, Middleburg Heights, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 212,908, Dec. 28, 1971, abandoned. This application Jan. 29, 1974, Ser. No. 437,695
Int. Cl.² B08B *3/00*
U.S. Cl. 136—100 R 20 Claims



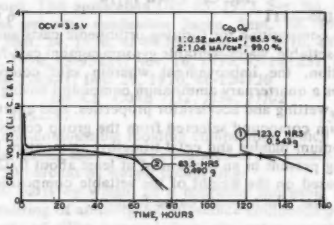
1. A coherent electrode for use in electrochemical devices having an aqueous electrolyte, said electrode comprising particulate manganese dioxide and particulate electrically conductive material both of which are substantially dispersed in a binder, said binder comprising colloidal electrically conductive material having a surface area as defined by the B.E.T. method using N_2 absorption at 78°K. of less than about 100 m^2/g, and an electrolyte-wettable polymer, thereby forming a polymeric binder.

3,945,848

LITHIUM-METAL OXIDE ORGANIC ELECTROLYTE SYSTEMS

Arabinda N. Dey, Needham, and Robert W. Holmes, South Natick, both of Mass., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation of Ser. No. 55,170, July 15, 1970, abandoned. This application June 24, 1974, Ser. No. 482,396
Int. Cl.² H01M *6/00*
U.S. Cl. 136—100 R 5 Claims



1. A high energy density cell comprising a positive electrode composed of a cobalt oxide positive electrode material selected from the group consisting of Co_2O_3 and Co_3O_4 and mixtures thereof; a negative electrode consisting of a metal selected from the group of light metals; said electrodes being disposed in an electrolyte comprising an organic solvent selected from the group consisting of tetrahydrofuran, N-nitrosodimethylamine, dimethyl sulfite, propylene carbonate, gamma-butyrolactone, dimethyl carbonate, dimethoxyethane, acetonitrile, and the mixtures thereof, and having dissolved therein soluble salts of the light metals, wherein said soluble salts are selected from the group consisting of perchlorates, hexafluorophosphates, tetrafluoroborates, tetrachloroaluminates, and hexafluoroarsenates.

3,945,849

BATTERY CELL WITH QUATERNARY AMMONIUM HALIDE

Arnold Hoffman, Brookline, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed June 26, 1970, Ser. No. 50,354
Int. Cl.² H01M 6/04
U.S. Cl. 136—107 11 Claims

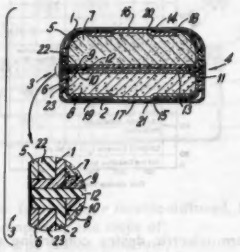
1. A primary battery cell comprising an ammonium chloride electrolyte, a metallic anode and a cathode wherein a quaternary ammonium halide compound is associated with said anode.

3,945,850

PLASTIC CASED PRIMARY CELL SHEATHED IN A SPLIT METAL CASE

Richard Walter Lewis, Ponteland, England, assignor to Timex Corporation, Waterbury, Conn.

Filed Apr. 24, 1975, Ser. No. 571,141
Int. Cl.² H01M 2/02
U.S. Cl. 136—107 3 Claims



1. An energy cell of the type having anode and depolarizing cathode material disposed in opposed plastic casing members with means separating the anode and cathode materials, a terminal portion electrically connecting with the anode or cathode material in each plastic casing member, wherein the improvement comprises:

a peripheral flange on each of said plastic casing members, said flanges being sealed juxtaposed to one another; and

a metal outer casing member being disposed and sealed on each of said plastic casing members with each metal outer casing member being contoured mates with said flanges to be substantially aligned therewith, said metal outer casing members each being electrically coupled to a respective terminal portion.

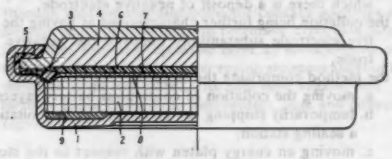
3,945,851

SILVER ZINC ELECTRIC STORAGE CELLS

Harold Trevor Mote, North Harrow, England; Laszlo Hajdu, Budapest, Hungary, and Bela Ronay, Erlangen, Germany, assignors to Medicharge Limited, North Harrow, England and Medicor Muvek, Budapest, Hungary

Filed June 13, 1974, Ser. No. 479,157
Claims priority, application United Kingdom, June 14, 1973, 28443/73
Int. Cl.² H01M 43/02
U.S. Cl. 136—111 5 Claims

1. A rechargeable silver-zinc electric storage cell comprising a casing enclosing a silver electrode and a zinc electrode, a separator comprising an imperforate semi-permeable membrane disposed between said electrodes, and an electrolyte, said membrane being sealed to the casing so that the only ion path between the electrodes is through said membrane, characterised in that said imperforate semi-permeable membrane comprises a laminate of plies of semipermeable oriented foil material bonded together with the electrolyte with some of the



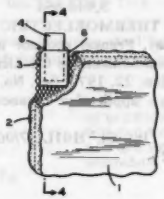
plies arranged cross-wise, as regards their direction of orientation, relative to another ply of the membrane.

3,945,852

CURRENT COLLECTOR FOR ORGANIC ELECTROLYTE BATTERIES

Arabinda N. Dey, Needham, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Sept. 6, 1974, Ser. No. 503,821
Int. Cl.² H01M 2/30
U.S. Cl. 136—135 R 2 Claims



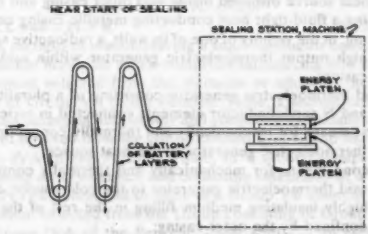
1. A cathode current collector assembly for use under corrosion-prone conditions which comprises a current collector body and a terminal tab welded thereto wherein only the immediate area where the tab is welded to said current collector is overlain, surrounded by and has heatsealed thereto foils consisting of polyolefin polymer.

3,945,853

METHOD OF SEALING A COLLATION OF BATTERY LAYERS TOGETHER

Kent V. Anderson, Madison, and John M. Bilhorn, Edgerton, both of Wis., assignors to ESB Incorporated, Philadelphia, Pa.

Filed Dec. 7, 1972, Ser. No. 312,927
Int. Cl.² H01M 6/00
U.S. Cl. 136—175 5 Claims



1. The method of producing a seal around an increment of continuous, collated battery-layers,

the collation including a layer having an increment on which there is a deposit of positive electrode,

the collation also including a layer having an increment on which there is a deposit of negative electrode,

the collation being further characterized as having the positive electrode substantially opposite the negative electrode,

the method comprising the steps of:

a. moving the collation of continuous battery layers;

b. temporarily stopping the increment of the collation at a sealing station;

c. moving an energy platen with respect to the stopped increment into a position so that the platen can transfer energy to the areas of the layers of the stopped increments surrounding the pair of opposed electrodes; and

d. transferring energy from the platen to the layers in a manner, in an amount, and for a time sufficient to heat the areas of the layers surrounding the electrodes;

e. subsequently maintaining pressure against the heated layers while simultaneously cooling the heated layers;

f. removing the increment of the collation from the sealing station while the simultaneously advancing another increment of the collation to the sealing station; and,

g. repeating steps (b), (c), (d), and (e) with respect to the other increment of the collation.

3,945,854

LONG-LIFE THERMOELECTRIC GENERATOR

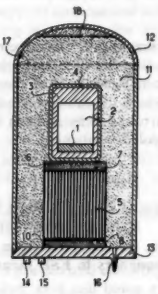
Michel Alais, Orsay, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Jan. 22, 1973, Ser. No. 325,351

Claims priority, application France, Jan. 20, 1972, 72.01828

Int. Cl.[2] H01L *37/00*

U.S. Cl. 136—202 **21 Claims**



1. A very long-lasting thermoelectric microgenerator comprising an outer casing acting as a cold source;

a heat source disposed inside said outer casing and including a fluid-tight heat conducting metallic casing containing, in the vicinity of one of its walls, a radioactive source;

a high output thermoelectric generator within said outer casing;

said thermoelectric generator consisting of a plurality of P and N semiconductor elements connected in series;

first means for mechanically and thermally connecting said thermoelectric generator to the heat source;

second means for mechanically and thermally connecting said thermoelectric generator to the cold source; and

a highly insulating medium filling in the rest of the space confined by the outer casing;

said first and second means each comprising a layer of resilient resin, being electrically insulating and having a low heat resistance in relation to the resistance of said highly insulating medium confined by the external casing;

and said highly insulating medium being a resilient microporous mineral substance which is a poor heat conductor, degassed vigorously, set in a rarefied heavy gas atmosphere.

3,945,855

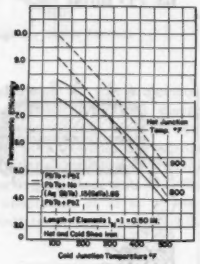
THERMOELECTRIC DEVICE INCLUDING AN ALLOY OF GeTe AND $AgSbTe_2$ AS THE P-TYPE ELEMENT

Emanuel Andrew Skrabek, Baltimore, and Donald Smith Trimmer, Timonium, both of Md., assignors to Teledyne, Inc., Los Angeles, Calif.

Division of Ser. No. 8,043, Feb. 2, 1970, Pat. No. 3,695,867, which is a continuation-in-part of Ser. No. 593,469, Nov. 10, 1966, abandoned, which is a continuation-in-part of Ser. No. 509,511, Nov. 24, 1965, abandoned. This application Mar. 8, 1972, Ser. No. 232,761

Int. Cl. H01v *1/18*

U.S. Cl. 136—238 **3 Claims**



1. A thermoelectric device comprising a P-type element consisting essentially of an alloy of GeTe and $AgSbTe_2$, containing both rhombohedral and face-centered cubic crystals and having a ZT value in excess of 1.3 at 750°K, an N-type element formed of a compatible material, and a chemically and electrically compatible conductor shoe electrically connecting said P-type element to said N-type element, the respective amounts of said GeTe and $AgSbTe_2$ present in said alloy being represented by the formula $(AgSbTe_2)_{1-x} + (GeTe)_x$, wherein x is expressed in mol fraction and has values of about 0.80 and 0.85.

3,945,856

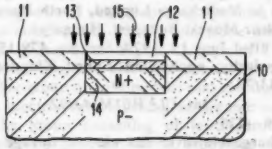
METHOD OF ION IMPLANTATION THROUGH AN ELECTRICALLY INSULATIVE MATERIAL

Wilfried G. Koenig, Sindelfingen, Germany; James S. Makris, Wappingers Falls, and Burton J. Masters, Poughkeepsie, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed July 15, 1974, Ser. No. 488,376

Int. Cl.[2] H01L *21/265*

U.S. Cl. 148—1.5 **9 Claims**



1. A method of ion implantation into a semiconductor substrate comprising

forming a protective layer on said substrate over a region to be ion implanted,

directing at said layer a beam of ions having sufficient energy to pass through said layer and penetrate said substrate,

maintaining said substrate below 1000°C,

removing at least the upper half of said layer through which said ions passed by etching, and, then

heating said substrate whereby said penetrated ions are driven further into said substrate to form said ion implanted region.

3,945,857

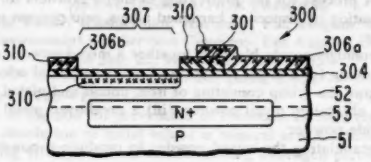
METHOD FOR FABRICATING DOUBLE-DIFFUSED, LATERAL TRANSISTORS

Richard D. Schinella, Mountain View, and Michael P. Anthony, San Carlos, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Division of Ser. No. 484,831, July 1, 1974, which is a division of Ser. No. 357,968, May 7, 1973, Pat. No. 3,873,989. This application Apr. 21, 1975, Ser. No. 570,124

Int. Cl.² H01L *21/26, 21/265, 21/20*

U.S. Cl. 148—1.5 **3 Claims**



1. A method for fabricating a double-diffused, lateral transistor structure comprising the steps of:

a. oxidizing a p-type silicon substrate;

b. forming an opening in the silicon dioxide layer formed by step (a);

c. predepositing an n^+-type impurity in the portion of the substrate exposed by said opening and heating said substrate to thermally drive said n^+-type impurity into said substrate to form a buried layer;

d. removing the remaining silicon dioxide formed by step (a) from the surface of said substrate;

e. epitaxially forming a layer of p-type conductivity;

f. forming a mask on the surface of said p-type epitaxial layer;

g. applying a thick silicon dioxide layer to mask against implanted high-energy ions;

h. removing said thick silicon dioxide applied by step (g) everywhere except over a portion of the active transistor structure to be formed;

i. applying a photoresist mask to define a base opening;

j. implanting an n-type impurity in said substrate through said base opening and through said mask formed by step (f);

k. removing said photoresist mask;

l. applying a thermal oxidation masking material to said mask formed by step (f) over said active transistor structure to be formed;

m. etching the portion of the epitaxial layer not covered by said thermal oxidation masking material to approximately one-half the depth of said epitaxial layer;

n. heating said epitaxial layer to thermally oxidize said etched portion of said epitaxial layer so that the surface of the isolation-forming, thermally-grown silicon dioxide corresponds approximately to the plane of the original surface of said epitaxial layer and so that said implanted n-type impurities diffuse to meet said buried layer;

o. removing said thermal oxidation material applied by step (1);

p. reoxidizing said substrate to form a thin protective oxide layer;

q. defining said protective silicon dioxide layer formed by step (p) to form emitter and collector contact openings;

r. predepositing a p-type impurity in said epitaxial layer through said emitter and collector contact openings and heating said epitaxial layer to thermally drive said p-type impurities into said epitaxial layer to form emitter and collector regions, said emitter region stopping short of the diffusion front associated with said base region; and

s. forming metal contacts to said emitter, base and collector regions.

3,945,858

METHOD OF MANUFACTURING STEEL FOR LOW TEMPERATURE SERVICES

Hiroyoshi Matsubara; Tatsumi Osuka, and Tadao Sugiyama, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1974, Ser. No. 451,953

Claims priority, application Japan, Mar. 19, 1973, 48-30854

Int. Cl.² C21D *7/13*

U.S. Cl. 148—2 **2 Claims**

1. A method of manufacturing steel for low temperature services consisting of the following chemical composition,

0.02 to 0.10% C,	0.10 to 0.50% Si,
1.20 to 1.80% Mn,	up to 0.030% P,
up to 0.015% S,	0.05 to 0.50% Ni,
0.05 to 0.50% Cr,	0.05 to 0.50% Cu,
0.01 to 0.10% Nb,	unavoidable impurities

and the balance being Fe,

further adding rare earth metal or an alloy thereof of 0.01 to 0.20% to the above steel at the stage of vacuum degassing or of pouring into a mold, and then, being as only hot-rolled at a rolling rate of from 30 to 80% at a temperature below 950°C.

3,945,859

METHOD OF MANUFACTURING SUPERCONDUCTORS OF β-TUNGSTEN STRUCTURE

Christianus Antonius Maria van Beijnen, Alkmaar, Netherlands, assignor to Reactor Centrum Nederland (Stichting), The Hague, Netherlands

Filed Mar. 22, 1974, Ser. No. 453,938

Claims priority, application Netherlands, Apr. 17, 1973, 7305400

Int. Cl.² H01L *39/24*

U.S. Cl. 148—11.5 R **14 Claims**

1. A method of manufacturing a superconductor consisting of different materials which comprises introducing into a first component selected from the elements or alloys of the elements of Group VB of the Periodic Table, a second component containing an accelerator and consisting essentially of an element selected from the Group consisting of Group IIIA and Group IVA of the Periodic Table, or a second component containing an accelerator and consisting essentially of a mixture of (1) a compound or alloy of a Group VB element with an element selected from the Group consisting of Group IIIA and Group IVA of the Periodic Table with (2) an element selected from the Group consisting of Group IIIA and Group IVA of the Periodic Table, and thermally treating said materials to produce a superconductor having a superconductive boundary layer.

3,945,860

PROCESS FOR OBTAINING HIGH DUCTILITY HIGH STRENGTH ALUMINUM BASE ALLOYS

Joseph Winter, New Haven; Michael J. Pryor, Woodbridge, and William C. Setzer, Hamden, all of Conn., assignors to Swiss Aluminium Limited, Chippis, Switzerland

Continuation of Ser. No. 140,580, May 5, 1971, abandoned. This application Dec. 23, 1974, Ser. No. 535,754

Int. Cl.² C22F *1/04*

U.S. Cl. 148—11.5 A **8 Claims**

1. A process for the preparation of aluminum having high strength and high ductility, comprising:

A. providing an aluminum base alloy containing from 0.05 to 1.0% iron, from 0.05 to 1.0% silicon, at least one material selected from the group consisting of less than 10.0% magnesium, less than 3.0% manganese, less than 1.0% copper, less than 0.5% chromium, less than 0.5% zinc, less than 0.5% zirconium, less than 0.5% titanium, less than 0.1% boron, others less than 0.5% each, total less than 1.5% balance essentially aluminum;

B. working said alloy, preferably by rolling or drawing, at a temperature between 450°F and 950°F with a total reduction in excess of 20%;

C. working said alloy, preferably by rolling or drawing, at a temperature below 450°F with a total reduction in excess of 20%;

D. holding said alloy at a temperature of from 250 to 650°F for a period of time no greater than defined in the following formula: $T\,(8.95 + \log t) = 5{,}700$, wherein T is temperature in degrees Kelvin and t is the maximum time in minutes at temperature T, so that there is no recrystallization throughout the matrix and so ther there is less than 10% loss in tenxile strength; and

E. repeating step C, thereby resulting in an alloy having a subgrain size of less than 0.001 mm with the subgrain walls being formed of pinned dislocation tangles.

3,945,861

HIGH STRENGTH AUTOMOBILE BUMPER ALLOY

William A. Anderson, Pittsburgh; Ralph W. Rogers, Jr., and William D. Vernam, both of New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 21, 1975, Ser. No. 570,267

Int. Cl.² C22F *1/04*

U.S. Cl. 148—12.7 **13 Claims**

1. In the production of an improved automotive bumper, the steps comprising

1. providing a body of aluminum alloy consisting essentially of 5.5–9% Zn, 0.8–2% Mg, 0.11–0.25% Cu, 0.05–0.2% Zr, balance essentially aluminum and incidental elements and impurities;

2. homogenizing said body at a temperature of 800°–900°F;

3. fabricating said body into a bumper section by operations which include hot or warm reductions in thickness and thereafter solution heat treating, quenching and artificially aging the resulting bumper product.

3,945,862

COATED FERROUS SUBSTRATES COMPRISING AN AMORPHOUS MAGNESIA-SILICA COMPLEX

Leonard S. Lee, Daly City; Howard M. Siegel, Pacifica, and Samuel W. Sopp, Foster City, all of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 373,728, June 26, 1973, abandoned. This application Nov. 15, 1974, Ser. No. 524,015

Int. Cl.² C22B *35/69*; H01F *1/00*

U.S. Cl. 148—31.5 **7 Claims**

1. A method of producing a separator and electrical insulating coating on magnetic ferrous material which comprises applying a coating composition comprising MgO, $Mg(OH)_2$ or mixtures thereof, at least one boron compound and at least one amorphous magnesia-silica complex containing from about 0.001 to 2.0 percent by weight of an alkali metal oxide or hydroxide, wherein the mole-ratio of the $MgO:SiO_2$ is from about 1:25 to 14:1, said magnesia-silica complex being amorphous as indicated by its X-ray powder diffraction pattern and exhibiting the following differential thermal behavior characteristics: an endothermic peak at about 250°C., an exothermic peak at about 820°C. and at about 980°C., to preoxidized magnetic ferrous material and annealing said material at an elevated temperature from about 950°–1500°C. for from about 2 to 50 hours in a neutral or reducing atmosphere and wherein the boron compound is present at from about 0.01 to 30 parts by weight and the magnesia-silica complex is present from about 2 to about 200 parts by weight per 100 parts by weight of MgO.

3,945,863

PROCESS FOR TREATING METAL POWDERS

Walter Precht, Towson, Md., assignor to Martin Marietta Corporation, Rockville, Md.

Filed Sept. 20, 1973, Ser. No. 399,159

Int. Cl.² B22F *1/00*

U.S. Cl. 148—126 **14 Claims**

1. A process for the pretreating of metal powders for the preparation of dispersion hardened alloys, said process comprising:

a. homogeneously blending together a mixed powder containing (i) a metal powder having a base metal selected from the group consisting of iron, cobalt and nickel, (ii) a chromium metal powder, (iii) a prealloyed metal carbide powder;

b. granulating the mixed powder to produce a powdered granulate;

c. classifying the powdered granulate to separate out the powdered granulate having a mesh size of about −40 +100; and

d. reducing the oxygen present in the separated out powdered granulate at a temperature of between about 1150°–1300°C. to form an unsintered granulate mass suitable for the preparation of dispersion hardened alloys.

14. A process for the pretreating of metal powders for the preparation of dispersion hardened alloys, said process comprising:

a. homogeneously blending together a mixed powder containing (i) a cobalt base nickel metal powder, (ii) a chromium metal powder and (iii) a titanium carbide and vanadium carbide powder mixture, said carbide powder mixture present in the amount of about 3–10 percent of the total weight of the mixed powder;

b. granulating the mixed powder in the presence of a polyvinyl chloride binder;

c. classifying the powdered granulate to separate out the powdered granulate having a mesh size of about −40 +80;

d. reducing the separated out powdered granulate with hydrogen at a temperature of between 1150°–1300°C. so as to reduce the oxygen present in the powdered granulate to below 400 ppm without sintering the powdered granulate mass; and

e. cooling the granulate to about room temperature in the presence of hydrogen to form a suitable granulate for the preparation of dispersion hardened alloys.

3,945,864

METHOD OF GROWING THICK EXPITAXIAL LAYERS OF SILICON

Norman Goldsmith, East Brunswick, and Paul Harvey Robinson, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 28, 1974, Ser. No. 473,766

Int. Cl.² H01L *21/205*, *21/302*; C01B *33/02*

U.S. Cl. 148—175 **4 Claims**

1. A method of growing an epitaxial layer of silicon, having a thickness of at least about 25 μm, on a surface of either a

(100) or (111) plane of a substrate of single-crystal silicon, said method comprising the steps of:

heating said surface to a temperatue of between about 1050°C and about 1200°C in a reactor furnace,

etching said surface in said reactor furnace by passing a mixture of gases through said reactor furnace, at a velocity of about 20 cm/second, to remove a portion of said surface, said mixture of gases comprising about 1% HCl gas and about 99% hydrogen gas, by volume,

purging said reactor furnace of said HCl gas by cutting off the supply of HCl gas in said mixture and either reducing the velocity of hydrogen gas or dropping the temperature in said reactor furnace until substantially all of said HCl gas is removed from said furnace, and

introducing dichlorosilane and hydrogen gas into said reactor furnace, at a temperature of between about 1050°C and 1200°C, in a concentration to react said dichlorosilane with said hydrogen gas to grow said epitaxial layer of silicon on the etched surface at a rate of between about 5–20 μm/minute.

3,945,865

METAL DISSOLUTION PROCESS

David Robert Kamperman, Harmony, Pa., assignor to Dart Environment and Services Company, Los Angeles, Calif.

Filed July 22, 1974, Ser. No. 490,456
Int. Cl.[2] C23F 1/00; C09K 13/04
U.S. Cl. 156—18 13 Claims

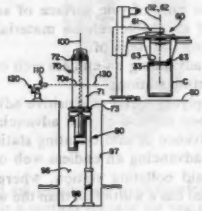
1. A method for prevention of evolution of NOx fumes in the dissolution of metal values in mineral acid solutions containing HNO_3 which comprises adding hydrogen peroxide to said acid solution, maintaining the hydrogen peroxide concentration during the dissolution at between about 1 and about 20 grams per liter and the mole ratio of hydrogen peroxide to mineral acid at a value of less than 0.273.

3,945,866

TIRE BUILDING APPARATUS FOR LARGE TIRES

Walter H. Rudder, Gadsden, Ala.; William D. Braden, deceased, late of Stow, Ohio (by Anna P. Braden, executrix); Charles J. McEvoy, Topeka, Kans.; Stokes R. Dodson, Jr., Topeka, Kans.; John R. Thiele, Topeka, Kans., and Allen L. Livgren, Topeka, Kans., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 24, 1974, Ser. No. 473,119
Int. Cl.[2] B29H 17/37
U.S. Cl. 156—126 18 Claims



1. The method of making a tire of the class described comprising:

building in cylindrical form about a horizontal axis a carcass including at least one tire carcass reinforcing ply and axially spaced apart tire beads enfolded in the respective ends of such ply;

building apart from said carcass a circumferentially endless tire breaker-belt;

unpending said carcass and said belt by rotating their respective axes from horizontal to vertical;

supporting said carcass in a vertical orientation about a vertical axis only by elastically expandable means engaging the interior surface thereof in a circumferential zone spaced axially inward of the beads and extending axially across the mid-circumferential plane of the carcass;

establishing a support plane parallel to the actual mid-circumferential plane of the so-supported carcass by positioning three support surfaces located at about equal angular intervals around and spaced radially outwardly of the carcass, each support surface being adjustable independently of the others of said support surfaces in directions parallel to said vertical axis;

then disposing said breaker-belt about and in radially spaced non-contacting relation to said carcass with the mid-circumferential plane of said breaker-belt parallel to said support plane;

moving said beads vertically equally and oppositely toward each other while expanding said carcass circumferentially into adherent contact with said breaker-belt;

thereafter applying about said breaker-belt and carcass a circumferentially endless tread and curing the tire.

3,945,867

PLASTIC HOSE MAKING METHOD

William C. Heller, Jr., Milwaukee, Wis., and Alfred F. Leatherman, Columbus, Ohio, assignors to William C. Heller, Jr., Milwaukee, Wis.

Filed Nov. 5, 1973, Ser. No. 404,095
Int. Cl.[2] B31C 13/00
U.S. Cl. 156—143 24 Claims

1. A method of making a composite hose having a generally dimensionally stable hollow plastic core suitable for receiving and conveying an internal pressure producing fluid and a tubular textile net surrounding the core for reinforcing the core against the pressure of the fluid, said method comprising the steps of:

applying a layer of thermally softenable material to the exterior of the core, said material being bondable to the core by thermal fusion but possessing substantial bonding incompatibility with the net, the material having uniformly dispersed therein a particulate susceptor having a size range of submicron to 20 microns and heatable upon exposure to a selected form of indirectly applied energy, the layer being applied in a thickness no greater than that which obtains a restraining partial embedment of the net in the bonding agent;

drawing the reinforcing net about the exterior of the core; and

exposing the layer material to a selected form of indirectly applied energy of sufficient heat generating properties and duration to transiently heat the layer for fusing the layer to the core and for providing a net embedding thermal softening of the layer to mechanically retain the net in the layer by the embedment in in the layer.

3,945,868

METHOD OF APPLYING HEAT INSULATING MATERIAL TO SHEET METAL

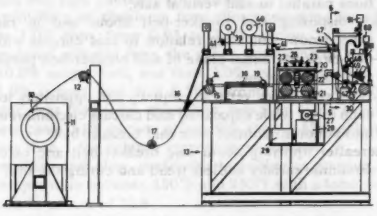
John Ian Menzies, Brisbane, Australia, assignor to Heatshield Research and Development Pty., Ltd., Brisbane, Australia

Filed May 31, 1973, Ser. No. 365,700

Claims priority, application Australia, June 1, 1972, 9173/72

Int. Cl.² B32B 31/08

U.S. Cl. 156—164 8 Claims



1. A method of bonding metal foil to sheet metal by an interposed film of polythene which is adhered to both and which separates the sheet metal and metal foil from direct contact, comprising the steps of:

a. drawing said sheet metal from a roll,

b. separately drawing said film and superimposing said film on said moving sheet metal,

c. separately drawing said foil and superimposing said foil on said film,

d. suspending said laminate between longitudinally spaced rollers,

e. applying weight and pressure to the laminated assembly of foil, film and sheet metal while in tension and so suspended by contacting and covering said laminate with a plurality of spaced weights which apply pressure by virtue of such weight to said laminate, and

f. applying heat to the underside of said sheet metal at least in the area below said weights, such heat melting said film and causing bonding of said film to said foil and said sheet metal due to the pressure applied to the laminate by said weights and the tension on the laminate.

3,945,869

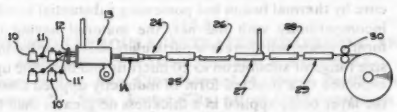
METHOD AND MEANS OF IMPROVING LAYDOWN AND WRITING CHARACTERISTICS OF FIBROUS POINTS AND POINTS OBTAINED THEREBY

Clinton Earl Miller, 8301 Georgetown Ave., Los Angeles, Calif. 90045, and Nabil Gabriel Naggar, 751 N. Gower St., Los Angeles, Calif. 90038

Filed July 1, 1974, Ser. No. 484,943

Int. Cl.² B43K 1/12; D04H 3/14

U.S. Cl. 156—180 4 Claims



1. In a method continually producing elongated elements adapted for use in writing instruments, said elements being composed of a plurality of parallel strands of yarns differing in denier per filament, bonded into a porous but strong element, the steps of:

maintaining a predetermined polar position for each yarn during manufacture and bonding, whereby the size and location of ink-conveying channels in the cross-section of the elements and the writing characteristics thereof are uniformly and positively controlled and maintained, including:

preheating the strands while out of contact with each other to a temperature of between about 110°C and 125°C without sintering or incipient fusion, and

providing a plurality of parallel open-ended, metal-walled passageways including axial and circumaxial passageways, each passageway being adapted to receive and permit a strand to be easily pulled therethrough with negligible contact with the walls:

discharging the preheated sorted individual strands onto a first conical surface surrounded by a conical heated enclosing surface spaced from the first, said enclosing surface leading to an entrance to an adjacent sintering tube coaxially aligned with and forwardly positioned with respect to the conical surfaces;

said conical surfaces bringing the various preheated and axially moving strands into initial contact in relative polar positions established substantially at the entrance to said sintering tube by the array of pathways and then drawing the contacting and positioned strands through the sintering tube to lightly sinter the moving yarns in said established polar position.

3,945,870

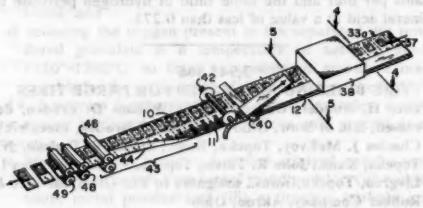
METHOD OF MAKING MULTI-LAYER COMPOSITE AND ARTICLES THEREFROM

Edward L. Johnsen, 12 Fox Meadow Lane, Wayland, Mass. 01778

Filed July 24, 1973, Ser. No. 382,162

Int. Cl.² B42D 15/00

U.S. Cl. 156—201 16 Claims



8. A continuous method of producing a multi-layer composite for subsequent processing into desired information bearing articles, wherein the composite comprises a continuous web of base material, a pressure sensitive adhesive coating selectively applied to portions only of one surface of said web, and a continuous web of strippable release material covering said adhesive, comprising the steps of:

a. continuously advancing an endless web of base material toward a collating station;

b. selectively applying pressure sensitive adhesive to a portion only of one surface of said advancing web of base material in advance of said collating station;

c. continuously advancing an endless web of release material toward said collating station, wherein the web of release material has a width less than the width of the web of base material;

d. collating said advancing web of release material with said advancing web of base material and in overlying relationship with the adhesive on said web of base material and in covering relationship to only a portion of said one surface of the web of base material, leaving a portion thereof exposed;

e. applying original indicia to the exposed portion of the web of base material;

f. continuously stripping the web of release material from the web of base material; and

g. disposing said adhesive coated portion of said web of base material in overlapping, adhesively secured relationship

with said exposed portion of said web, thereby concealing said original indicia therebetween, thus producing a multi-layer composite capable of being further processed into a plurality of information bearing articles by continuous mass production techniques.

9. A method as claimed in claim 2, including the steps of:

h. applying opaque areas to said web prior to the application of adhesive thereto;

i. providing an elongate fold line on and extending the full length of the web of base material for defining a pair of elongate, adjacent, interconnected panels collectively spanning the width of said web, wherein said adhesive pattern and web of release material are each disposed primarily on one of said panels;

j. advancing said composite with both of said elongate panels in flat, side-by-side relationship for applying the original indicia referred to in step *e* directly to the exposed surface of that panel of the pair which is free of release material;

k. continuously stripping the web of release material from the composite after the application of the original indicia to one of said panels;

l. thereafter folding said web of base material along said fold line for disposing the indicia bearing surface of one panel and the adhesively coated surface of the other panel in overlapping, adhesively secured relationship, concealing said original indicia therebetween and rendering access thereto impossible without mutilation of at least on of said panels; and

m. transversely subdividing the continuous length of adhesively secured elongate panels into individual ticket like articles each of which include concealed original indicia which is unique to each individual article.

3,945,871

METHOD OF MAKING A TREAD FOR THE RECAPPING OF TIRES

Wilhelm Schelkmann, Witten, Germany, assignor to Vakuum Vulk Holdings Ltd., Nassau, Bahamas

Filed Sept. 6, 1973, Ser. No. 394,721

Claims priority, application Germany, Sept. 9, 1972, 2244391

Int. Cl.² B29H *5/04, 17/36*

U.S. Cl. 156—212 **9 Claims**

1. A method of producing a circumferentially complete storable tread or a section thereof for use in the recapping of tires, comprising the steps of providing a mold having a bottom surface of an outline complementary to the desired profile of an external surface of the tread; introducing into the mold an effective amount of raw rubber so as to form in the mold a layer having an exposed surface corresponding to the internal surface of the tread and a concealed surface adjacent to the bottom surface of the mold; pressing against said exposed surface of said layer a deforming structure having a plurality of projections and recesses to impart to said exposed surface a complementary configuration and to simultaneously press said layer against the bottom surface of the mold so that said concealed surface assumes said desired profile; converting said layer into a prefabricated tread having a profiled external surface and a configurated internal surface suited for subsequent bonding to a tire to be recapped, including heating said layer; applying a removable layer of impermeable material to said internal surface of said tread to prevent access of the ambient air to said internal surface; and storing said tread prior to the use thereof for recapping for a storage period during which oxidation of the rubber forming said internal surface is prevented by said layer, whereby said internal surface is ready for immediate bonding without roughening to a tire to be recapped upon removal of said layer of impermeable material.

3,945,872

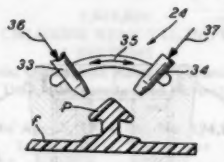
MAKING PLASTIC FILM WITH PROFILES AND OPENING MEANS FOR BAGS

Takashi Noguchi, Tokyo, Japan

Continuation-in-part of Ser. No. 178,086, Sept. 7, 1971, Pat. No. 3,787,269. This application Dec. 26, 1973, Ser. No. 428,433

Int. Cl.² B32B *31/30*

U.S. Cl. 156—244 **8 Claims**



1. In the method of making plastic film with shaped profiles on the surface comprising the steps of:

extruding a continuous length of an interlocking profile from a die opening with the profile having a precise shape for interlockingly engaging with another profile;

and directing a flow of coolant onto the extruded profile of warm plastic and adjusting the direction of flow of coolant relative to the direction of movement of the profile for controlling the cooling rate and shape of the profile.

3,945,873

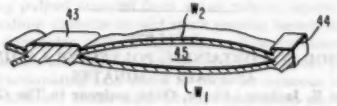
PROCESS FOR BONDING NON-WOVEN FIBROUS SHEETS AND ARTICLES MADE THEREFROM

Robert O. Osborn, Richmond, Va., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed May 3, 1974, Ser. No. 466,843

Int. Cl.² B32B *31/20, 31/12*

U.S. Cl. 156—271 **14 Claims**



1. A process for bonding a first layer of fibrous, non-woven, polymeric sheet material to a second layer of compatible, thermoplastic, polymeric sheet material comprising the steps of:

a. superposing, in overlapping contact with one another, said first and second layers of polymeric sheet material to form a composite sheet;

b. applying at least one stream of hot polymeric material onto the surface of said second layer of polymeric sheet material to form a narrow continuous bead of hot polymeric material; and

c. after a time sufficient to allow the hot polymeric material of said bead to begin to fuse said first layer of non-woven

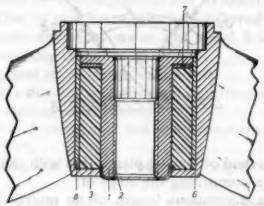
polymeric sheet material, cooling said bead by contacting it with a smooth solid surface, maintained at a temperature below the solidification temperature of the polymeric material in said bead, and simultaneously deforming said bead, by pressing said solid surface against the upper surface of said bead with a force sufficient to cause the hot polymeric material of said bead to permeate said first layer of non-woven polymeric sheet material and to cause the edges of said bead to extend beyond the region where the polymeric material of the bead has permeated said first layer of non-woven polymeric sheet material.

3,945,874

METHOD OF ASSEMBLING HUBS, PARTICULARLY PROPELLER HUBS FOR BOAT ENGINES

Karl Gustaf Backstrom, Charlottenberg, and Kjell-Idar Borgersen, Ytterby, both of Sweden, assignors to AB Volvo Penta, Goteborg, Sweden

Continuation of Ser. No. 287,040, Sept. 7, 1972, abandoned. This application Aug. 5, 1974, Ser. No. 494,865
Int. Cl.² B32B 31/04
U.S. Cl. 156—294 6 Claims



1. An improved method of assembling a propeller hub intended for boat engines, said hub comprising a propeller sleeve, a tubular sleeve arranged in said propeller sleeve coaxially therewith, a hub sleeve arranged in said tubular sleeve coaxially therewith, and a rubber bushing disposed between said tubular sleeve and said hub sleeve to absorb torsional stresses occuring between said two sleeves, the improvement comprising threading said rubber bushing in non-vulcanized condition onto said hub sleeve, placing said rubber bushing and said hub sleeve together in correct positions in said tubular sleeve, vulcanizing said bushing to said hub sleeve and to said tubular sleeve, and thereafter securing the assembly within said propeller sleeve.

3,945,875

METHOD FOR OBTAINING POLYESTER LAMINATES AND SAID LAMINATES

William E. Jackson, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 838,324, July 1, 1969. This application Feb. 2, 1972, Ser. No. 222,970
Int. Cl.² C09J 5/02
U.S. Cl. 156—308 6 Claims

1. A method of forming a laminate of two specimens comprising treating the surface of a polyester specimen with an organic isocyanate containing ethylenic unsaturation, then applying a fluid adhesive comprising an organic peroxide curative and an unsaturated polyester to at least one of the specimens to be laminated, placing the treated polyester specimen in laminating relationship with the other specimen and curing the adhesive to bond the specimens together, said polyester specimen being the reaction product of a polycarboxylic acid or anhydride with a polyol.

3,945,876

BONDING WITH POLYISOCYANATES

Dominick Bianca, Wilmington, Del., assignor to E. I. DuPont de Nemours & Company, Wilmington, Del.

Filed Apr. 7, 1972, Ser. No. 242,224
Int. Cl.² C09J 3/00
U.S. Cl. 156—331 16 Claims

1. A method of bonding (1) a segmented thermoplastic copolyester composition consisting essentially of a multiplicity of recurring long chain ester units and short chain ester units joined head-to-tail through ester linkages, said long chain ester units being represented by the formula

I

and said short chain units being represented by the formula

II

where G is a divalent radical remaining after the removal of terminal hydroxyl groups from a poly(alkylene oxide) glycol having a molecular weight of about 400–6000 and a carbon to oxygen ratio of about 2.0–4.3; R is a divalent radical remaining after removal of carboxyl groups from a dicarboxylic acid having a molecular weight less than about 300 and D is a divalent radical remaining after removal of hydroxyl groups from a diol having a molecular weight less than about 250; provided said short chain ester units amount to about 15–95 percent by weight of said copolyester, and at least about 50% of said short chain ester units are identical and (2) a substrate selected from the group consisting of fiber-forming condensation polymers or regenerated cellulose which comprises applying to either said copolyester or said substrate a polyisocyanate reaction product having an available isocyanato group content of at least 2 percent and being obtained by reacting an excess of a polyisocyanate with a liquid polyol or a polyamine having an equivalent weight of about 30–2000 and then contacting said copolyester and said substrate in the presence of either elevated pressure and/or temperature.

3,945,877

CROSS LINKABLE THERMOPLASTIC ADHESIVES

Arthur J. Marcozzi, Franklin Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 365,776, May 31, 1973, Pat. No. 3,880,791. This application Oct. 25, 1974, Ser. No. 517,993
Int. Cl.² C08L 91/00, 95/00
U.S. Cl. 156—332 4 Claims

1. Method of adhering surfaces comprising

A. forming an adhesive composition comprising, by weight

a. about 25 to 50 percent pitch;

b. about 20 to 40 percent ethylene vinyl acetate copolymer;

c. about 20 to 40 percent ethylene - acrylic acid copolymer; and

d. about 0.5 to 10 percent dicumyl peroxide into a shape applicable to the surfaces to be joined, at a temperature above the melting temperature of the ethylene polymers;

B. applying the shaped composition to the surfaces to be joined; and

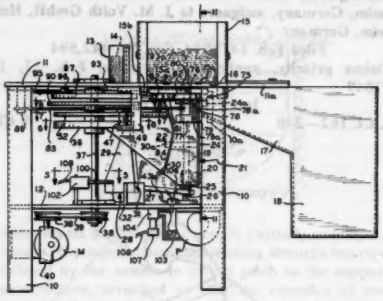
C. heating the composition to the surfaces to be joined.

3,945,878

STAMP APPLYING MACHINE

Richard W. Hubschmitt, Warren, N.J., assignor to Schneider Tool and Manufacturing Co., West Orange, N.J.

Filed Aug. 16, 1974, Ser. No. 498,038
Int. Cl.² B65C 9/14, 9/20
U.S. Cl. 156—539 8 Claims



1. A machine for automatically applying stamps to envelopes comprising respective magazines for said stamps and envelopes mounted in parallel arrangement, respective vacuum pads for picking off said stamps and envelopes one by one from the same ends of said respective magazines, a main carriage for said vacuum pads mounted for back and forth shifting movement in the directions of said magazines, means yieldably mounting said pads on said main carriage for independent movement relative to the carriage in directions of said shifting movement, means mounting said respective pads on said carriage for traveling movement at right angles to the carriage movement to and from a stamping station whereat a stamp from the stamp magazine is placed in overlapping relation to an envelope from the envelope magazine, and power means cyclically operable for imparting a first reciprocation to said main carriage towards and from said magazines to cause said pads to pick off a stamp and an envelope from the respective magazines, to impart then a traveling movement to each of said pads to said stamping station, and to impart next a second reciprocation to said carriage in the directions of said shifting movement to cause said stamp to be pressed against said envelope.

3,945,879

APPARATUS FOR POSITIONING MODULAR COMPONENTS ON A VERTICAL OR OVERHEAD SURFACE

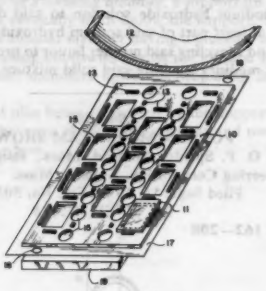
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Cyrus C. Haynie, Newport Beach, and Samuel V. Messineo, Hawthorne, both of Calif.

Filed Aug. 30, 1974, Ser. No. 502,137
Int. Cl.² B32B 31/00
U.S. Cl. 156—556 6 Claims

1. An apparatus for supporting and positioning a plurality of objects in a preselected configuration against a curved surface comprising:

a fixture for supporting said objects while said objects are being attached to said curved surface; said fixture being flexible to allow said fixture to conform to said curved surface and said fixture having a plurality of projections extending outward from said fixture for locating and maintaining said objects in a predetermined orientation and spacing as said fixture and objects conform to said curved surface;

uniform pressure means for applying a uniform pressure to said fixture and objects; said uniform pressure holding said fixture and objects against said curved surface while said objects are being attached to said curved surface; and



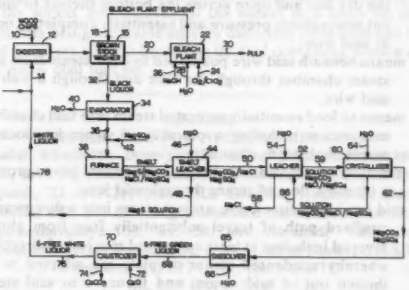
positioning means for locating said fixture and objects adjacent to said surface prior to the application of said load means.

3,945,880

SODIUM CHLORIDE REMOVAL IN PULP MILL SYSTEMS

Jerome A. Lukes, Ogden, and Robert P. Schroeder, Salt Lake City, both of Utah, assignors to Erco Envirotech Ltd., Islington, Canada

Filed Aug. 5, 1974, Ser. No. 494,897
Int. Cl.² D21C 3/02, 11/04
U.S. Cl. 162—17 24 Claims



1. In a pulp mill process which comprises digesting cellulosic fibrous material with a pulping liquor containing sodium hydroxide and sodium sulphide as the pulping chemicals, separating pulped material from spent pulping liquor, introducing sodium chloride to said spent pulping liquor, forming a smelt containing sodium sulphide, sodium carbonate, sodium chloride and sodium sulphate from said spent pulping liquor, fractionating said smelt to form an aqueous sodium sulphide solution and a solid mixture of sodium carbonate, sodium sulphate and sodium chloride substantially free from sodium sulphide, and recycling said aqueous sodium sulphide solution to said digestion step to provide at least part of said sodium sulphide in said pulping liquor, the improvement which comprises leaching said solid mixture with an aqueous medium to dissolve substantially completely said sodium carbonate and sodium sulphate therefrom thereby to form an aqueous sodium carbonate and sodium sulphate solution and leave substantially pure solid sodium chloride, refrigerating said aqueous sodium carbonate and sodium sulphate solution to deposit a solid mass of sodium carbonate and sodium sulphate substantially free from sodium chloride, separating said deposited solid mass from the mother liquor, forming an aqueous solution of said separated mass, converting at least a substantial proportion of the sodium carbonate in the aqueous

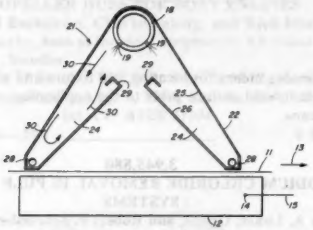
solution of said mass to sodium hydroxide, recycling the resulting sodium hydroxide solution to said digestion step to provide at least part of said sodium hydroxide in said pulping liquor, and recycling said mother liquor to provide part of said aqueous medium leaching said solid mixture.

3,945,881

FOURDRINIER STEAM SHOWER

Thomas O. P. Speidel, Bedford, Mass., assignor to Lodding Engineering Corporation, Auburn, Mass.

Filed Sept. 11, 1974, Ser. No. 505,131
Int. Cl.² D21F 5/18
U.S. Cl. 162—208 **6 Claims**



1. Apparatus for heating a paper web on a Fourdrinier wire to increase removal of water therefrom comprising

a steam chamber positioned above the wire, substantially across the entire width of said wire at least partly beyond the dry line and open across the bottom thereof to ambient atmospheric pressure and essentially completely open to said wire,

means beneath said wire positioned to draw steam from said steam chamber through the wire and through a web on said wire,

means to feed essentially saturated steam into said chamber, said means including a plurality of steam jets located across said steam chamber,

means to supply steam under pressure to said jets to provide a directed flow of steam through said jets,

said jets being directed to project steam into a downwardly confined path of travel substantially free from abrupt reversal including at least an upward reversal of direction, whereby condensed steam droplets are adapted to be thrown out of said steam, and thence into said steam chamber,

means at the bottom of said confined path of travel at the point of upward reversal to collect condensed steam and to drain water therefrom,

a discharge opening into said steam chamber of a size to prevent abrupt expansion of said steam,

whereby a volume of dry, essentially saturated steam is drawn through said web and wire to heat said paper by release of latent heat of condensation of said steam.

5. A method for increasing removal of water from a paper web on a Fourdrinier machine comprising:

directing jets of essentially saturated steam in a downwardly confined path substantially free from abrupt reversal including at least an upward reversal of direction of motion,

collecting and removing condensed steam at the bottom of said confined path of motion at the point of upward reversal to provide essentially dry, essentially saturated steam,

thereafter directing said saturated steam at atmospheric pressure and substantially free from expansion above said web at a location at least partly beyond the dry line of said paper web, and

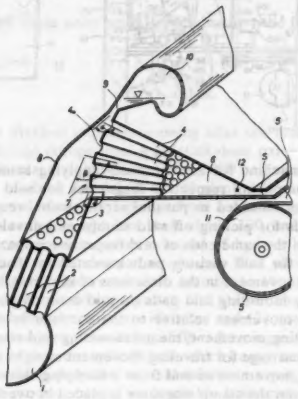
drawing said steam through said paper web to condense at least a portion of said steam within the volume of the paper web, thereby releasing latent heat of condensation within said web.

3,945,882

STOCK INLET ARRANGEMENT FOR A PAPER-MAKING MACHINE

Dieter Egelhof, and Karl Wolf, both of Heidenheim-Schnaitheim, Germany, assignors to J. M. Voith GmbH, Heidenheim, Germany

Filed Feb. 14, 1974, Ser. No. 442,594
Claims priority, application Germany, Feb. 17, 1973, 2307849
Int. Cl.² D21F 1/02
U.S. Cl. 162—340 **9 Claims**



1. A stock inlet arrangement for a paper-making machine, comprising a stock supply conduit; a slice; and a pre-slice flow distributing system communicating with said slice for directing a flow of paper-making stock from said supply conduit to said slice, said system including a manifold extending longitudinally of said slice spaced therefrom and having an inlet side through which stock flows from said conduit in a direction transversely of the elongation of said manifold, a first side wall extending from said inlet side in said flow direction and having a first side wall portion which is convex transverse to said flow direction so as to be tangentially approached by the flowing stock and which is formed with a plurality of outlet openings each having a center axis, and a second side wall transversely spaced from and extending along said first side wall and having a second side wall portion which is so inclined with reference to said first side wall portion that the direction of flow of stock traveling between and guided by said side wall portions includes identical angles with said center axes of the respective outlet openings.

3,945,883

LIQUID METAL COOLED NUCLEAR REACTORS

John Richard Hind, Warrington, and John Graham Durston, Northwich, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

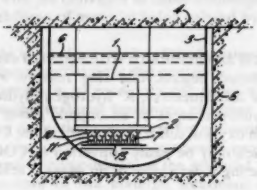
Filed Aug. 13, 1974, Ser. No. 497,068
Claims priority, application United Kingdom, Aug. 24, 1973, 40295/73
Int. Cl.² G21C 9/00
U.S. Cl. 176—40 **6 Claims**

1. A liquid cooled nuclear reactor construction comprising:

a primary vessel containing a pool of liquid coolant,

a nuclear reactor core submerged in the pool of liquid coolant,

a catchment tray for collecting debris falling from the core, the catchment tray comprising a complex of open top collecting vessels having central support struts and a substructure for supporting the collecting vessels, the vessels being spaced apart and arranged in layers in lattice pitch, the lattice pitch of the vessels in each layer being off-set to the lattice pitches of the vessels in the



other layers so that upper vessels partially overlap lower vessels, the support struts extending through interspaces defined by the vessels in off-set pitch to the supporting substructure, arranged so that the complex of vessels presents a complete catchment area to falling debris whilst being pervious to liquid coolant circulating upwardly by convection.

3,945,884

FUEL PARTICLES HAVING PYROLITIC CARBON COATING FOR NUCLEAR REACTORS AND THE MANUFACTURE OF SUCH FUEL

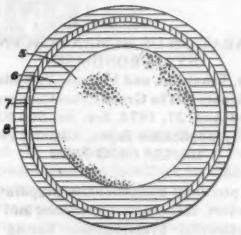
David Vernon Freck, London, England, assignor to Central Electricity Generating Board, London, England

Continuation-in-part of Ser. No. 135,231, April 19, 1971, abandoned. This application Sept. 11, 1973, Ser. No. 396,231

Claims priority, application United Kingdom, Apr. 20, 1970, 18833/70

Int. Cl.² G21C *3/02*

U.S. Cl. 176—68 **6 Claims**



1. A nuclear reactor fuel body of the kind in which the fuel material is in the form of a kernel coated with a pyrolytic carbon coating and with an outer matrix graphite coating wherein a small quantity of radium 226 is incorporated in the kernel.

3,945,885

MEANS FOR SUPPORTING NUCLEAR FUEL

Peter Cocker, Leyland, and Michael Anthony Price, Thornton Cleveleys, both of England, assignors to British Nuclear Fuels Limited, England

Filed Oct. 1, 1973, Ser. No. 402,384

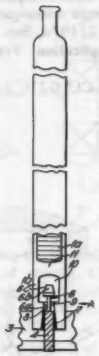
Claims priority, application United Kingdom, Oct. 17, 1972, 47862/72

Int. Cl.² G21C *3/10, 3/32*

U.S. Cl. 176—78 **3 Claims**

1. A nuclear fuel assembly comprising: a number of metal clad fuel pins having a fuel containing portion and an end extension shaped as a locating member, a support for supporting the fuel pins vertically from below the support, comprising an annular member having a plurality of spaced beams extending chordwise across the annular member, rows of support members upwardly projecting from said beams,

each of said fuel pins being supported by the support by co-operation between its locating member and one of said support members,



said locating members and support members being shaped as co-operating spigots and sockets, whereof each spigot has an enlarged head portion which enters through a necked portion of the socket into a cavity of the socket as a force fit, the members being separable only by distortion of at least one of said members without breaching the fuel containing portion of the metal clad fuel pin.

3,945,886

CONTROL ROD FOR NUCLEAR REACTOR

Nikolai Efimovich Derevyankin, ulitsa Sovnarkomovskaya, 30, kv. 115; Vladimir Ivanovich Evseev, ulitsa Strazh Revoljutsii, 22, kv. 21; Ivan Ilich Zhuchkov, ulitsa 22 Partsiezda, 6/2, kv. 60; Oleg Borisovich Samoilov, ulitsa Sovnarkomovskaya, 32, kv. 20, and Alexandr Vasilievich Ovechkin, ulitsa Tolbukhina, 6, kv. 2, all of Gorky, U.S.S.R.

Filed Oct. 21, 1974, Ser. No. 516,471

Int. Cl.² G21C *7/10*

U.S. Cl. 176—86 R **1 Claim**

1. A control rod for a nuclear reactor, accommodated in the core of said reactor and comprising: a series of hollow links; pivotal joints interconnecting said series of links into an articulated structure; at least one of said links of said series, which is the endmost one, serving as a gas collecting means; a neutron absorbing material accommodated in the rest of said links

of said series; flexible members extending through said pivotal joints and establishing serial fluid communication between said links, with said flexible members being adapted to convey the gas produced as a result of the absorption of neutrons by said neutron absorbing material to said gas collecting means.

3,945,887

HEAT-INSULATING LINING FOR A FAST REACTOR

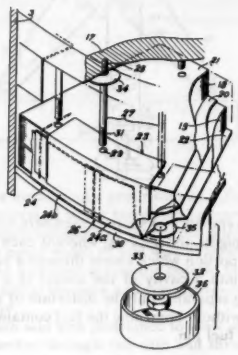
Guy Lemercier, Le-Puy-Sainte-Reparade, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed June 12, 1974, Ser. No. 478,705

Claims priority, application France, June 26, 1973, 73.23338

Int. Cl.² G21C *11/08*

U.S. Cl. 176—87 **8 Claims**



1. In a fast nuclear reactor, a heat-insulating lining for a shield slab which serves to close the biological shield structure of said fast reactor comprising an open tank mounted within the shield structure and containing the reactor core immersed in a mass of liquid-metal coolant and a layer of inert blanket gas which is present above said coolant, said heat-insulating lining being comprising a set of panels each constituted by a mat of superposed elements of metallic fabric or trelliswork extending parallel to the shield slab to be heat-insulated, wherein the set of panels is enclosed within at least one metallic casing fixed against the shield slab and so arranged that the end walls of said casing which are parallel to the panels are formed by sealing plates applied against said panels, the sides of the casing which connect the sealing plates to each other being constituted by at least two interengaged L-section members having two flanges at right angles, one flange of each member being adapted to cover one sealing plate whilst the other two flanges delimit therebetween a narrow lateral gap forming a capillary seal.

3,945,888

METHOD FOR THE PRODUCTION OF CEPHALOSPORINS

Takeshi Takahashi; Kenji Kawahara; Toshiyuki Takahashi; Koichi Kato, and Yoshio Yamazaki, all of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Japan

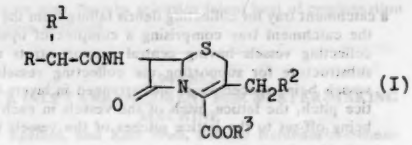
Filed Dec. 4, 1973, Ser. No. 421,636

Claims priority, application Japan, Dec. 6, 1972, 47-122205

Int. Cl.² C12D *9/00*

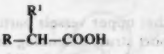
U.S. Cl. 195—29 **7 Claims**

1. A method for the production of a cephalosporin of the formula:



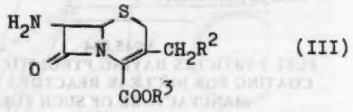
(I)

wherein R is an unsaturated six-membered carbocyclic ring or five-membered heterocyclic ring residue which may have uncharged substituent(s); R^1 hydrogen, hydroxy, or halogen; R^2 is a hydrogen atom or an organic group which is bound through an oxygen, sulfur or nitrogen atom; $COOR^3$ is an ester group which may be easily converted to COOH, which comprises reacting a derivative of an organic acid of the formula:



(II)

wherein R and R^1 have the same meaning as defined above with 7-aminocephem-4-carboxilic acid ester of the formula:



(III)

wherein R^2 and $COOR^3$ have the same meaning as defined above in the presence of a culture or the enzyme containing processed matter of said culture of the microorganism of one of the genera *Escherichia*, *Bacillus*, *Proteus* and *Pseudomonas* which is able to synthesize a cephalosporin of the formula (I) from a derivative of the organic acid of the formula (II) and 7-aminocephem-4-carboxylic acid ester of the formula (III).

3,945,889

PREPARATION OF HUMAN PLACENTAL HYALURONIDASE

Yasuhiro Mima, Takatsuki, and Masaaki Yamada, Kyoto, both of Japan, assignors to The Green Cross Corporation, Japan

Filed Aug. 27, 1974, Ser. No. 500,939

Claims priority, application Japan, Aug. 28, 1973, 48-97066

Int. Cl.² C07G *7/026*

U.S. Cl. 195—62 **14 Claims**

1. A human placental hyaluronidase preparation free from hypotensive factors, blood type substances, and hemoprotein, said human placental hyaluronidase having a molecular weight of about 70,000, an isoelectric point of pH about 5.2 and enzymatic optimum pH ranging from 3.6 to 4.0, and being stable for at least 24 hours when kept below 30° C. at pH 6–7 in an aqueous solution.

3,945,890

CONVERTER SYSTEM

Klaus M. Kemp, 2410 Anacapa St., Santa Barbara, Calif. 93105

Filed July 26, 1974, Ser. No. 492,010

Int. Cl.³ C10B *1/06, 7/06, 27/00*

U.S. Cl. 202—84 **5 Claims**

1. A converter system comprising:

a. an elongated housing defining a longitudinally extending material treatment chamber, having an entrance end and an exit end;

b. an endless conveyor for carrying organic, pseudo-organic and inorganic material through the material treatment chamber and extending between the housing entrance

end and exit end, the conveyor having an upper flight that travels through the material treatment chamber and a lower flight that travels beneath the material treatment chamber;

c. drive means coupled to the conveyor for moving the conveyor through the material treatment chamber of the housing;

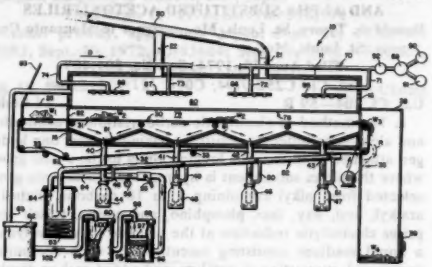
d. heating means in the housing arranged in heat exchange relationship with the conveyor to cause decomposition by thermal breakdown of material being carried by the conveyor;

e. loading means located externally of the housing entrance end for feeding material onto the conveyor;

f. multiple sequentially aligned take-off tubes depending from the housing material treatment chamber and into corresponding collection containers for collecting liquid, gaseous and vapor streams of decomposed product created by thermal decomposition of the material;

g. a bottom portion of the material treatment chamber formed with a plurality of conically shaped troughs arranged to guide decomposed product created by thermal decomposition into corresponding take-off tubes;

h. an elongated manifold in fluid communication with top portions of the collection containers and arranged to accept fluid (gases and vapors) streams led from the collection containers;



i. a condenser arranged and constructed in fluid communication with the manifold to accept the fluid (gases and vapors) stream from the manifold, to chill the fluids and collect resulting condensation;

j. gas scrubber means in communication with the condenser for removing entrained particulate matter from the fluid (gases and vapors) stream, the gas scrubber means including multiple serially aligned gas scrubbers for absorbing, adsorbing and eliminating particulate matter entrained in the fluid (gases and vapors) stream led from the condenser;

k. booster pump means positioned downstream of and in fluid communication with the gas scrubber means, the booster pump means being arranged and constructed to apply negative pressure sufficiently upstream to draw the fluid (gases and vapor) stream from the material treatment chamber and along a tortuous flow path eventually passing through the gas scrubber means;

l. regulator means operatively coupled to the booster pump means for maintaining pressure in the material treatment chamber within a range slightly above ambient pressure; and,

m. an accumulator located externally of the housing exit end for accumulating processed solid material, and cooling, sorting, and continuously conveying away the material.

3,945,891

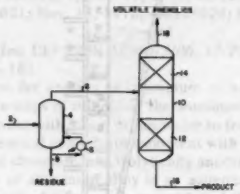
DISTILLATION PROCESS FOR PURIFICATION OF TRIARYL PHOSPHATE ESTERS

Robert A. Aal; Norman H. C. Chen, and James K. Chapman, Jr., all of Yardley, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed June 20, 1974, Ser. No. 481,161

Int. Cl.² B01D *3/00, 3/10*

U.S. Cl. 203—77 **8 Claims**



1. A process for purifying triaryl phosphate esters prepared by the phosphorylation of phenol, C_1–C_4 alkyl substituted phenols and mixtures of same consisting essentially of:

a. subjecting the crude triaryl phosphate ester reaction mixture of flash distillation at a temperature of about 220° to 320°C and a pressure of 2 to 10 mm. Hg and removing catalyst residues and high boiling impurities in an underflow and removing at least 90% of the feedstock as an overhead distillate comprising triaryl phosphate ester product and unreacted phenols, and

b. fractionally distilling the overhead from the flash distillation step in a fractional distillation column having a low pressure drop per theoretical stage maintained at a temperature of about 250° to 300°C and at a pressure of 4 to 10 mm. Hg at the base of said column and a temperature of about 60° to 200°C and a pressure of 2 to 4 mm. Hg at the top of said column, and

c. removing the purified triaryl phosphate ester product as a liquid underflow from the base of said column, the product being characterized as containing less than about 100 parts per million of unreacted phenols, free phenol, and alkyl phenols.

3,945,892

ELECTROCHEMICAL PROCESS AND APPARATUS INCLUDING MEANS FOR EQUALIZING PRESSURE ACROSS THE ION-PERMEABLE WALL

George Stephen James, Johannesburg; Bruce Ian Dewar, Randburg, and Walter Rudolf Moergeli, Roodepoort, all of South Africa, assignors to Parel. Societe Anonyme, Luxembourg, Luxemburg

Filed July 30, 1974, Ser. No. 493,649

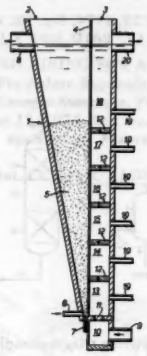
Claims priority, application South Africa, Aug. 3, 1973, 73/5311

Int. Cl.² C25B *15/08*

U.S. Cl. 204—1 R **14 Claims**

3. In an electrochemical cell comprising first and second electrode compartments separated by an ion-permeable wall, said first electrode compartment containing a particulate electrode consisting of a bed of discrete, electroconductive particles and having associated therewith means for causing an overall upward flow of fluid through the first electrode compartment whereby the particles of the particulate electrode are caused to move during use of the electrochemical cell, and said second electrode compartment containing a non-particulate electrode and having associated therewith means for causing an upward flow of liquid through said second electrode compartment, the improvement which comprises liquid flow impeding means disposed in said second electrode compartment so as to establish a gradient in the

operating pressure in said second electrode compartment during use of the cell which is such that the difference in



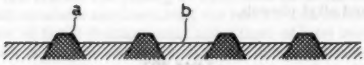
pressure across said ion-permeable wall at any particular point thereof is less than that required to rupture the wall.

3,945,893

PROCESS FOR FORMING LOW-ABRASION SURFACE LAYERS ON METAL OBJECTS

Shigeru Ishimori, Hamana, and Shinjiro Otsuka, Hamamatsu, both of Japan, assignors to Suzuki Motor Company Limited, Japan

Filed Dec. 27, 1973, Ser. No. 428,655
Claims priority, application Japan, Dec. 30, 1972, 47-2353
Int. Cl.² C25D *5/52, 7/10;* **C25F** *3/00*
U.S. Cl. 204—16 **18 Claims**



4. A method as set forth in claim 3 wherein said fine particles of a hard material protrude between about 0.1 μ and 15 μ above the surface of said metal coating.

3,945,894

BATH COMPOSITION AND METHOD OF ELECTRODEPOSITING UTILIZING THE SAME

Sylvia Martin, Detroit; Hans Gerhard Creutz, Yale, and Donald Harvey Becking, West Bloomfield, all of Mich., assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Apr. 11, 1975, Ser. No. 567,346
Int. Cl.² C25D *3/22*
U.S. Cl. 204—55 R **7 Claims**

6. A method for electrodepositing zinc to provide enhanced throwing power and an improved brightened electrodeposit, which comprises forming an acidic aqueous zinc electroplating bath which includes therein a zinc salt selected from the group consisting of zinc sulfate, zinc fluoborate, zinc chloride, zinc acetate, zinc sulfamate, or zinc gluconate, and dissolving therein a polymeric additive selected from the group consisting of polymerized polyglycidol and copolymers of polyglycidol and alkylene oxides, the ready polymers thereof, and epichlorohydrin.

3,945,895

METHOD OF PRODUCING COLORED ANODIC COATING ON ALUMINUM AND ITS ALLOYS

Masanori Osuga, Yokohama, and Hayao Adachi, Kawasaki, both of Japan, assignors to Fujisash Industries, Ltd., Kawasaki, Japan

Filed Dec. 5, 1974, Ser. No. 529,927
Int. Cl.² C25D *11/10*
U.S. Cl. 204—58 **13 Claims**

1. A method of producing colored anodic coating on aluminum and its alloys comprising:

providing at least one cathode;

immersing the aluminum or its alloys as an anode into an aqueous electrolyte comprising an aromatic sulfonic acid;

passing a direct current through the electrolyte solution between the anode and cathode to obtain a colored anodic coating on the aluminum;

wherein, an improvement comprises employing, as said aqueous electrolyte, an aqueous electrolyte solution containing (a) aromatic sulfonic acid in an amount of 10 to 500 g/liter and (b) at least one member selected from the group consisting of formic acid and formate salts in an amount of 5 to 200 g, in terms of the weight of formic acid, per liter of the electrolyte.

3,945,896

ELECTROLYTIC CARBOXYLATION OF ACETONITRILE AND ALPHA-SUBSTITUTED ACETONITRILES

Donald A. Tyssee, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 28, 1974, Ser. No. 501,409
Int. Cl.² C25B *3/04;* **C07C** *121/407, 51/00*
U.S. Cl. 204—59 R **14 Claims**

1. The method of electrolytic carboxylation of acetonitrile and alpha-substituted acetonitriles having at least one hydrogen attached to the carbon located alpha to the cyano group, where the alpha substituent is hydrogen or an organic group selected from alkyl containing 1 to 10 carbons, inclusive, aralkyl, aryl, oxy, thio, phosphino, and amino, which comprises electrolytic reduction at the cathode by electrolysis in a liquid medium consisting essentially of such acetonitrile compound, supporting electrolyte, and added carbon dioxide, and recovering an alpha-cyano carboxylated product of such acetonitrile compound.

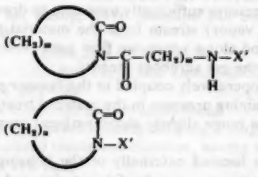
3,945,897

PHOTOHALOGENATION OF LACTAMS AND CERTAIN PRODUCTS THEREOF

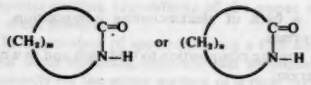
Sam Kwon Choi, Seoul, South Korea, assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 309,082, Nov. 24, 1972, Pat. No. 3,875,147. This application Nov. 8, 1974, Ser. No. 522,036
Int. Cl.² C07D *205/06, 207/26, 223/10*
U.S. Cl. 204—158 HA **8 Claims**

1. A method of making a compound of the formula:

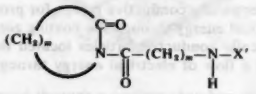


which comprises contacting a solution of a lactam of the formula:



in an organic solvent with a hologenating agent selected from the group consisting of chlorine gas or liquid bromine in the presence of ultraviolet light, wherein *m* is 2 or 3, *n* is 5 to 11 and X′ is chlorine or bromine.

6. A compound of the formula:



wherein

m is 2 or 3; and

X′ is chlorine or bromine.

3,945,898

METHOD FOR COATING METAL SURFACE WITH CARBON

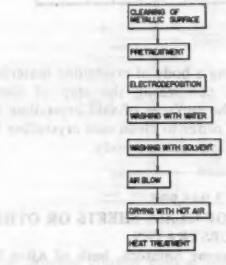
Rokuro Tsuji, Chiba, and Toshinori Niwa, Mobara, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 19, 1973, Ser. No. 398,790

Claims priority, application Japan, Sept. 20, 1972, 47-93603; Sept. 20, 1972, 47-93604; Sept. 20, 1972, 47-93605

Int. Cl.² C25D *13/02*, *13/10*

U.S. Cl. 204—181 15 Claims



1. A method for coating a surface of a metal or a metallized body to form a substantially pure carbon coating thereon comprising treating said surface with an aqueous electrodepositing liquid consisting essentially of carbon and at least one water soluble organic resin to form an electrodeposited carbon film on said surface and heat treating said carbon film at a temperature of about 300° to 1,000°C. to substantially completely decompose the organic resin in said carbon film.

3,945,899

PROCESS FOR COATING ALUMINUM OR ALUMINUM ALLOY

Norio Nikaido; Shinji Shirai; Mototaka Iihashi, and Sueo Umemoto, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Limited and Fuji Sashi Industries Limited, both of, Japan

Filed July 1, 1974, Ser. No. 484,985

Claims priority, application Japan, July 6, 1973, 48-76953; Aug. 3, 1973, 48-87279; Nov. 16, 1973, 48-128899; Nov. 15, 1973, 48-129021; Nov. 15, 1973, 48-129024; Nov. 19, 1973, 48-129912

Int. Cl.² C25D *5/00*, *13/06*, *13/20*

U.S. Cl. 204—181 18 Claims

1. A process for coating an aluminum or aluminum alloy comprising the steps of subjecting the aluminum or aluminum alloy to treatment with steam or hot water to form a boehmite layer or to chemical conversion treatment with at least one of phosphate and chromate, electrolytically anodizing the resulting aluminum or aluminum alloy in an aqueous solution of a water-soluble salt of at least one oxyacid, and thereafter coating the aluminum or aluminum alloy with an organic coating composition to form a resin layer, said oxyacid being at least one oxyacid selected from the group consisting of silicic acid, phosphoric acid, molybdic acid, vanadic acid, permanganic acid, stannic acid and tungstic acid.

3,945,900

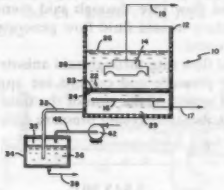
ELECTRO ULTRAFILTRATION PROCESS AND APPARATUS

Peter R. Klinkowski, Norwalk, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 249,701, May 2, 1972, abandoned. This application Sept. 23, 1974, Ser. No. 508,409

Int. Cl.² C25D *13/06*; B01D *13/02*

U.S. Cl. 204—181 10 Claims



1. In a process for electrophoretic deposition of a coating on a first electrode from a bath containing polymeric coating material disposed in a fluid medium wherein an ultrafiltration process is employed to maintain the concentration of polymeric coating material in the bath at a substantially constant level while deposition proceeds, the improvement whereby a polymeric anisotropic ulrafiltration membrane is maintained in a substantially clean and unfouled condition and functions to remove excess fluid medium and contaminants from the bath, comprising,

subjecting said bath to the ultrafiltration process proximate a second electrode which is isolated from the main bath volume by said anisotropic ultrafiltration membrane and thereby establishing and maintaining a volume of ulrafiltrate depleted in polymeric material at said second electrode, said volume of ultrafiltrate being closed off from the atmosphere,

withdrawing ultrafiltrate from said volume established at said second electrode to maintain a pressure differential of at least about 5 psi across said anisotropic membrane and a first flow increment of fluid medium from said bath through said anisotropic membrane,

energizing the electrodes to establish an electrical current traversing said anisotropic membrane for electrophoretic deposition of said polymeric material, thereby inducing migration of said polymeric material in said main bath volume and, particularly, in the region adjacent said membrane, toward said first electrode essentially in counterflow to the flow of fluid medium through said anisotropic membrane whereby said membrane is maintained in a substantially unfouled condition,

said current inducing a second flow increment of fluid from said main bath volume of ultrafiltrate at said second electrode, the total flow of fluid medium through said membrane being directly proportional to the current applied and the total flow through the membrane being substantially greater than the sum of the flows individually attributable to the effects of pressure and current.

5. An ultrafiltration system for treating a filterable fluid medium which is capable of attaining accelerated transport of filtrate through an anisotropic ultrafiltration membrane, comprising,

a vessel having two chambers separated by said anisotropic ultrafiltration membrane, one of said chambers being open to the atmosphere and the other closed to the atmosphere,

said anisotropic ultrafiltration membrane comprising a thin skin of from about 0.1 to 5 microns in thickness having an average pore diameter of from about 1 to 1,000 millimicrons on a coarsely porous support layer,

means for establishing a pressure differential between said chambers across said anisotropic membrane wherein the fluid at higher pressure bears on the skin surface of said membrane and is capable of forcing filtrate through said membrane at a first flow rate,

an electrode in each of said chambers adapted to be immersed in the fluid therein,

means for establishing an electrical potential between said electrodes to thereby initiate a flow of electrical current between said electrodes across said membrane,

said current flow being capable of initiating a flow of fluid at a second flow rate through said membrane which is supplementary to said fluid flow generated by said pressure differential,

the total fluid flow rate through said anisotropic membrane when both pressure and current are applied being substantialy in excess of the sum of the fluid flow rates individually attributable to said pressure differential and said current.

3,945,901

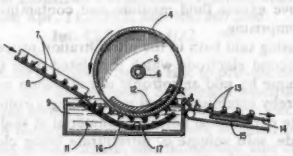
METHOD FOR ELECTROCOATING CONDUCTIVE ARTICLES

Joseph D. Nessar, Painesville, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 371,149, June 18, 1973, Pat. No. 3,898,151. This application Dec. 13, 1974, Ser. No. 532,392

Int. Cl.² C25D *13/04*

U.S. Cl. 204—181 **9 Claims**



1. The method of electrocoating a plurality of discrete, magnetically-attractable and electrically-conductive metallic articles of manufacture by establishing contact between said articles and a bath of electrocoating composition, which method comprises:

A. feeding coating composition to said bath and to a coating zone therein;

B. establishing a magnetic field with magnet means in close proximity to said coating zone and having sufficient field strength to attract coated articles located in at least a portion of the zone;

C. providing a rotatable member proximate to, but spaced apart from, said magnet means and offering in rotation a face element in continuous surface-wetting contact with coating composition in the bath;

D. establishing electrically conductive means for providing a flow of electrical energy through the coating zone and through electrically conductive articles located therein, and impressing a flow of electrical energy through said means; while,

E. feeding articles into said coating zone, into contact with said impressed flow of electrical energy and into the influence of said magnetic field, whereby said articles are coated and attracted onto the face element of said intervening rotatable member; and

F. rotating said member and moving on said face element the wet, coated articles within the bath while said articles are under the influence of said magnetic field.

3,945,902

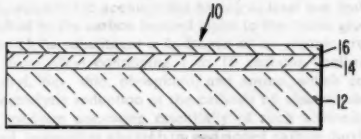
METALLIZED DEVICE AND METHOD OF FABRICATION

Frank Zygmunt Hawrylo, Trenton, and Henry Kressel, Elizabeth, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed July 22, 1974, Ser. No. 490,792

Int. Cl.² C23C *15/00*

U.S. Cl. 204—192 **6 Claims**



1. A method of preparing a body of crystalline material for subsequent metallization comprising the step of simultaneously sputter etching the surfaces of said crystalline body and an oxide substrate in order to clean said crystalline body and to provide an oxide layer on said body.

3,945,903

SPUTTER-COATING OF GLASS SHEETS OR OTHER SUBSTRATES

John S. Svendor, and Eugene Shintock, both of Allen Park, Mich., assignors to Shatterproof Glass Corporation, Detroit, Mich.

Filed Aug. 28, 1974, Ser. No. 501,174

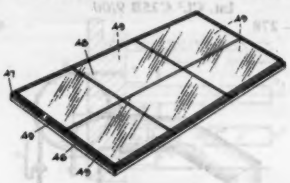
Int. Cl.² C23C *15/00*

U.S. Cl. 204—192 **4 Claims**

1. In combination with apparatus for sputter-coating a thin film of metal on a glass sheet substrate including a coating chamber, sputter-coating means mounted in the upper portion of said chamber, a metal platen having a major upper supporting surface, and means for conveying the metal platen into, through and out of said coating chamber, the improvement which consists (of) in providing an overlay for the metal platen formed of a (siliceous material) single plate of glass freely supported on and completely covering the upper major supporting surface of the platen in contact therewith and (directly supporting thereon) adapted to freely support the glass sheet substrate thereon and in contact therewith during

the sputter-coating (operation) of the upper surface of the glass sheet substrate.

3. In the method of sputter-coating a thin film of metal on a glass sheet substrate, wherein said substrate is supported horizontally on the upper surface of a rigid metal platen and



conveyed through a coating chamber, the improvement comprising covering the upper surface of said platen with an overlay consisting of a single plate of glass freely supported thereon in direct contact therewith, and then freely supporting the glass sheet substrate to be coated on said glass plate overlay in direct contact therewith.

3,945,904

PROCESS CONTROL SYSTEM

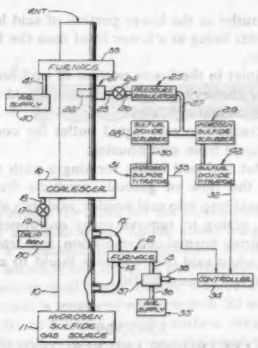
James Ray Robison, La Mirada, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Feb. 11, 1974, Ser. No. 441,103

The portion of the term of this patent subsequent to Dec. 17, 1991, has been disclaimed.

Int. Cl.² G01N *36/16*

U.S. Cl. 204—195 T **12 Claims**



1. A process control system comprising: first means for connection with apparatus confining the flow of a fluid, a portion or all of said fluid at least sometimes being hydrogen sulfide gas, said first means having an outlet conduit and being actuable to supply a flow of a sample of said fluid through said outlet conduit; first and second scrubbers, each of said scrubbers having an inlet conduit connected from said first means outlet conduit to receive first and second portions of said fluid sample, respectively, and having its own outlet conduit, said first and second scrubbers being chargeable with first and second solutions, respectively, such that said first and second scrubbers pass hydrogen sulfide and sulfur dioxide, respectively, whenever they are carried in said first and second fluid sample portions, respectively, and while said first and second scrubbers remove sulfur dioxide and hydrogen sulfide, respectively, from said first and second fluid sample portions, respectively; first and second coulometric titrators having first and second inlet conduits, respectively, and first and second electrical output leads, respectively, said first titrator inlet conduit being connected from said first scrubber outlet conduit to receive the fluid output thereof, said first titrator producing an electrical output signal on said first lead thereof of a magnitude directly proportional to the concentration of hydrogen sulfide in said sample fluid, said second titrator inlet conduit being connected from said second scrubber outlet conduit to receive the fluid which passes through said second scrubber outlet conduit, said second titrator producing an electrical output signal on said second output lead thereof of a magnitude directly proportional to the concentration of sulfur dioxide in said sample fluid; and second means connected from said first and second output leads of said first and second titrators, respectively, for connection with said flow confining apparatus at a location upstream of the connection of said first means therewith, said responsive to said titrator output signals and the magnitudes thereof for introducing oxygen in pure form or in a fluid mixture into said fluid confining apparatus at a variable flow rate and at a temperature to oxidize hydrogen sulfide therein; flow of fluid in said flow confining apparatus, said first means, said first and second scrubbers, said first and second titrators, and said second means each forming a link in a closed loop null seeking servo-mechanism in which said second means is actuable to vary or maintain constant said oxygen flow rate in a manner to drive the magnitudes of the output signals of said titrators to values indicating that there are concentrations larger than zero of both hydrogen sulfide and sulfur dioxide in said sample fluid and to values indicating that the concentration of hydrogen sulfide in said sample fluid times the molecular ratio 64/34 is approximately twice as large as the concentration of sulfur dioxide in said sample fluid.

3,945,905

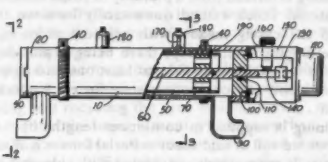
ELECTROLYTIC CELL

Adrian Persson, Palo Alto, Calif., assignor to Raymond Lee Organization Inc., New York, N.Y., a part interest

Filed Nov. 20, 1974, Ser. No. 525,566

Int. Cl.² C25B *1/24, 1/26*

U.S. Cl. 204—212 **5 Claims**



1. An electrolytic cell comprising:

a fixed hollow cylindrical open ended electrically conductive cathode;

an electrically conductive axle rotatable about its axis and aligned with the axis of the cathode;

a hollow cylindrical open ended electrically conductive anode disposed between and spaced from the cathode and axle, the axle being aligned with the axis of the anode;

electrically nonconductive plugs disposed between the anode and axle to mechanically connect the anode and axle whereby the axle and anode rotate as a unit, said plugs having openings to permit passage of water therethrough;

electrically conductive connectors biased against the axle and attached to the anode to electrically connect the axle and anode;

a plurality of electrically nonconductive brushes disposed on the external surface of the anode and secured thereto, said brushes being rotated as the anode rotates and sweeping radially over the inner surface of the cathode;

means for rotating the axle; and

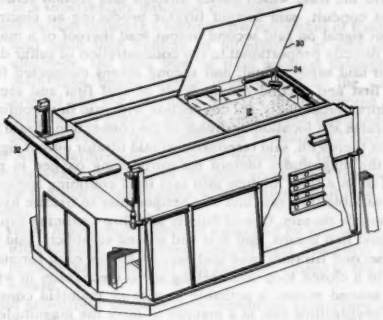
means for introducing a flow of water containing dissolved salt between the anode and cathode.

3,945,906

ANODE LINING SYSTEM

Travis R. Givens, Town Creek, Ala., assignor to Reynolds Metals Company, Richmond, Va.

Filed June 6, 1974, Ser. No. 476,863
Int. Cl.² C25C 3/12, 7/02
U.S. Cl. 204—245 3 Claims



1. In an aluminum reduction cell having a continuous self-baking anode of substantially rectangular shape, permanent casing means for the anode, support means for the casing means, a plurality of side entry electrical contact pins entering the anode on opposite sides thereof through clearance holes in the support means and corresponding slots in the casing means, the slots being elongated vertically to allow for adjusting the anode position within the casing means, and an inner lining for achieving a slippage between the anode and the casing means when adjusting their relative positions, the lining being disposed between the anode and the casing means along each anode side and end and having the contact pins punched through the portions thereof along each anode side, the improvement wherein:

the lining is formed from a plurality of strips of flexible sheet material which extend downwardly between the anode and the casing means, with adjacent strips in laterally overlapping relationship, there being a plurality of side strips for each anode side, at least one end strip for each anode end and one corner strip for each anode corner; and

the lining is supplied in continuous lengths by a rotatably mounted roll of said sheet material for each of said strips, the rolls respectively associated with side and end strips being placed to provide for feeding adjacent strips along a common pass line with their edges overlapping, each roll associated with an anode corner strip being mounted for rotation on a diagonal axis and including means for folding said strips as it leaves said roll to form side and end portions of said strip which overlap the adjacent side and end strips.

3,945,907

ELECTROLYTIC CELL HAVING RHENIUM COATED CATHODES

Sudarshan D. Gokhale, Trenton, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Sept. 16, 1974, Ser. No. 506,557
Int. Cl.² C25B 11/04, 9/00
U.S. Cl. 204—266 9 Claims

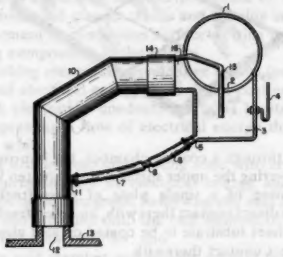
1. In an electrolytic cell for the production of halogen and caustic or alkali metal hypohalides and chlorates from alkali metal halide solutions wherein the cell is equipped with anodes and cathodes, the improvement which comprises a composite cathode comprising a metal substrate having thereon a coating of rhenium.

3,945,908

LIQUID SEAL FOR CHLORINE HEADERS

Stephen W. Hempell, West Vancouver, and Ben J. Mentz, North Vancouver, both of Canada, assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed June 20, 1974, Ser. No. 481,298
Int. Cl.² C25B 9/00
U.S. Cl. 204—278 4 Claims



1. In an electrolytic cell comprising an outlet for gaseous products formed in said cell, said outlet communicating with a header for collection of the gaseous products from a series of similar cells, the improvement which comprises attaching to said header a trap comprising

a. a housing having a gas inlet communicating with the gas outlet of said cell,

b. a baffle positioned in and extending across said housing, said baffle being attached to the top of said gas inlet and forming a part thereof, said baffle extending downwardly into said housing and terminating above the bottom thereof,

c. a liquid outlet in the lower portion of said housing, said liquid outlet being at a lower level than the lower end of said baffle,

d. a liquid inlet in the lower portion of said housing,

e. means for conveying liquid from said liquid outlet to the gas outlet of said cell, and

f. means attached to said liquid outlet for controlling the flow of liquid from said housing,

Said gas inlet and said baffle forming a path through said trap for the flow of gaseous products from said cell through said trap into said header, said trap allowing a gas flow and acting to remove spray entrapped in the gas stream during normal cell operation, said trap preventing gas flow when said trap contains liquid to a level above the lower end of said baffle.

3,945,909

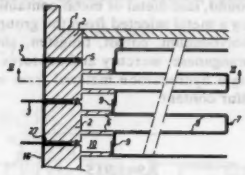
BIPOLAR ELECTRODES AND ELECTROLYTIC CELL THEREWITH

Umberto Giacopelli, Rosignano-Solvay, Livorno, Italy, assignor to Solvay & Cie, Belgium

Filed Mar. 25, 1974, Ser. No. 454,552
Claims priority, application France, Mar. 28, 1973, 73.11713
Int. Cl.² B01K 3/06; C01B 11/26
U.S. Cl. 204—284 12 Claims

1. In a bipolar electrode for a diaphragm type electrolyser, a self-supporting, upstanding bipolar electrode structure comprising, in assembled relationship, a generally vertical supporting wall, a plurality of generally vertical, laterally spaced, parallel anode plates, transversally connected to said wall, on one side thereof and extending away therefrom, and a plurality of generally vertical, spaced parallel foraminous cathode fingers, transversally connected to the opposite side of said wall and extending away therefrom, and alternating with the anodes, the improvement which comprises at least a portion of said supporting wall comprising a plurality of apertured

generally vertical elongated metallic members supporting the cathode fingers and each extending between two anode plates, said cathode fingers being in communication with one another through apertures provided through said metallic members,



and said portion of said wall comprising extensions of the anode plates, alternating with and clamped between the vertical elongated metallic members supporting the cathode fingers to make said portion of said wall continuous and self-supporting on the anode side thereof.

3,945,910
DIAPHRAGM FOR AN ELECTROLYSIS CELL

Jean De Ceuster, Vilvoorde, Belgium, and Bruno Grassi, Rosignano-Solvay, Livorno, Italy, assignors to Solvay & Cie, Belgium

Filed June 13, 1974, Ser. No. 478,973
Claims priority, application Belgium, June 15, 1973, 132292
Int. Cl.² C25B *13/00*; C25C *7/04*
U.S. Cl. 204—296 **12 Claims**

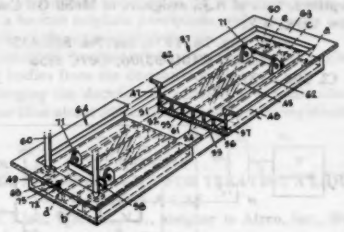
1. A diaphragm for a cell for the electrolysis of an aqueous solution of an alkali metal halide comprising a mixed sheet formed of a substantially homogeneous mixture of fibers of amphibole asbestos and fibrils of polyvinylidene fluoride connected together, said fibrils having a three-dimensional network structure, a length of about 0.5 to 50 mm., a thickness of about 0.01 to 5 and a specific surface area greater than 1 m.²/g. and forming ribbons having a thickness of less than 4 u.

3,945,911
CATHODES FOR SPUTTER-COATING GLASS SHEETS OR OTHER SUBSTRATES

Harold E. McKelvey, Plymouth, Mich., assignor to Shatterproof Glass Corporation, Detroit, Mich.

Filed Aug. 28, 1974, Ser. No. 501,175
Int. Cl.² C23C *15/00*
U.S. Cl. 204—298 **5 Claims**

1. In combination with apparatus for sputter-coating thin films of a selected coating material on glass sheets or other substrates, a plurality of aligned, contiguous rectangular chambers, including an entry chamber, a coating chamber and an exit chamber, means for conveying the glass sheets to be coated into, through and out of the successive chambers, and a rectangular cathode arranged transversely in said coating chamber and mounted (in the opening in) adjacent the top wall thereof, said cathode comprising a housing having a top wall, a bottom wall and side and end walls defining a closed chamber, the improvement which comprises means in said closed chamber defining a serpentine passageway formed of spaced, parallel passages extending longitudinally of said chamber, said passages communicating at alternate ends with adjacent passages to form the serpentine passageway, and means for circulating a cooling medium through said passage-



way, said bottom wall of the cathode adapted to secure a layer of coating material thereon.

2. The improvement of claim 1, in which the means defining the serpentine passageway comprises a plurality of spaced, parallel partitions that extend longitudinally of said chamber, and in which alternate partitions terminate short of the opposite end walls of the said closed chamber.

3,945,912
UREA DEWAXING OF LOW N-PARAFFIN CONTENT OILS

Maximilian Kunert, Neu-Wulmstorf, and Hans-Georg Wegner, Tangendorf, both of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed June 28, 1974, Ser. No. 484,002
Claims priority, application Germany, June 30, 1973, 2333470
Int. Cl.² C10G *43/04*
U.S. Cl. 208—25 **8 Claims**

1. In a process for dewaxing liquid mineral oils comprising reacting said liquid mineral oils with urea in the presence of an organic solvent to form solid, n-paraffin-urea adducts, separating said adducts from the solution of the dewaxed mineral oil, decomposing or extracting the separated adducts, recovering and recycling the urea and, optionally, recovering the n-paraffins, the improvement which comprises:

a. diluting a mineral oil containing less than 2 weight percent of a n-paraffins with an organic solvent, said solvent being one which does not form an adduct with urea, in which urea is substantially insoluble and which has a density substantially below that of the n-paraffin-urea adduct,

b. combining the mineral oil solution with solid urea, the amount of urea being a multiple of the amount required for the completed conversion of the n-paraffins into n-paraffin-urea adduct,

c. vigorously mixing the mixture of mineral oil solution and urea by pumping the mixture of mineral oil solution and urea through a closed loop whereby said mixture is continuously circulated for a period of time sufficient to form n-paraffin-urea adduct,

d. separating from the mixture of step (c) a solids-free solution of dewaxed mineral oil, and

e. recovering from said solids-free solution the organic solvent and a dewaxed mineral oil product having a reduced n-paraffin content,

f. continuously removing a portion of said circulating mixture,

g. removing the solids from said portion,

h. returning said solids-free portion to said circulating mixture,

i. recovering the urea from the separated solids of step (g) by decomposing the adduct in said solids, and

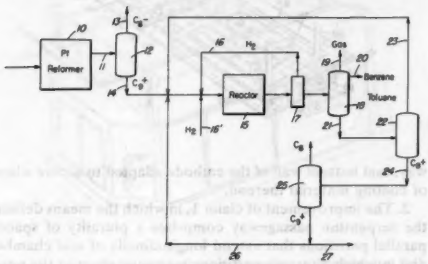
j. returning the recovered urea to the circulating mixture.

3,945,913

MANUFACTURE OF LOWER AROMATIC COMPOUNDS

James A. Brennan, Cherry Hill, and Roger A. Morrison, West Deptford, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 26, 1974, Ser. No. 500,432
Int. Cl.[2] C10G 35/06; C07C 3/58
U.S. Cl. 208—137 33 Claims



1. In the manufacture of gasoline and concurrent production of chemical grade aromatic compounds of eight or less carbon atoms by catalytic reforming of naphtha and using part of the reformate for each purpose, the improvement resulting in higher quality gasoline of lower "heavy end" content, which comprises fractionating a catalytic reformate to provide a light reformate containing most of the C_6 and lighter components of the reformate and a heavy reformate which contains no more than 20 weight percent of xylenes, blending said light reformate with other motor fuel components to provide a finished gasoline, contacting said heavy reformate with a catalyst characterized by an effective amount of type ZSM-5 zeolite, zeolite ZSM-12 or zeolite ZSM-21 under conditions to remove from alkyl aromatics side chain alkyl groups of greater than one carbon atom and produce therefrom aliphatic hydrocarbons containing more carbon atoms than the side chains so removed and to produce more xylenes then contained in said heavy reformate and to also produce benzene and toluene, said conditions being about 550° to about 1000°F., about 100 to about 2000 pounds per square inch, about 0.5 to 10 mols of hydrogen per mol of hydrocarbon and a weight hourly space velocity between about 0.1 and about 200 unit weights of hydrocarbon per unit weight of said zeolite in the catalyst per hour, and recovering from the product of contacting said heavy reformate with said catalyst aliphatic hydrocarbons having a greater number of carbon atoms than the side chains of alkyl aromatics in said heavy reformate and at least one aromatic hydrocarbon of eight or less carbon atoms in an amount greater than quantity of said aromatic hydrocarbon in said heavy reformate.

3,945,914

PROCESS FOR "SULFUR REDUCTION OF AN OXIDIZED HYDROCARBON BY FORMING A METAL-SULFUR-CONTAINING COMPOUND"

Jin Sun Yoo, and Andrew P. Voss, both of South Holland, Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Aug. 23, 1974, Ser. No. 499,885
Int. Cl.[2] C10G 29/04, 29/06, 27/04
U.S. Cl. 208—208 R 14 Claims

1. A process for producing a hydrocarbon material of reduced sulfur content which comprises:

1. contacting a sulfur-containing hydrocarbon material with an oxidant to preferentially oxidize at least a portion of the sulfur and form an oxidized sulfur-containing hydrocarbon material, a major amount of said sulfur-containing hydrocarbon material boils above about 550°F.;

2. contacting said oxidized sulfur-containing hydrocarbon material with at least one metal or metal-containing compound at a temperature within the range from about 500°F. to about 1350°F., to form a metal-sulfur-containing compound, said metal or metal-containing compound comprising a metal selected from the group consisting of nickel, molybdenum, cobalt, tungsten, zinc, vanadium, copper, manganese, mercury and mixtures thereof; and

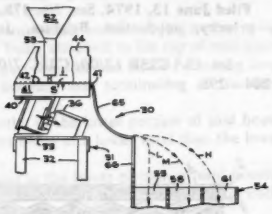
3. recovering a hydrocarbon material from step (2) of reduced sulfur content.

3,945,915

METHOD OF AND APPARATUS FOR ASSORTING PARTICLES ACCORDING TO THE PHYSICAL CHARACTERISTICS THEREOF

Donald C. Wilson, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 330,896, Feb. 9, 1973, Pat. No. 3,904,517.
This application Dec. 30, 1974, Ser. No. 537,485
Int. Cl.[2] B07B 15/00
U.S. Cl. 209—12 3 Claims

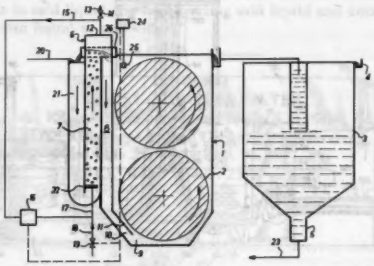


1. An apparatus for continuously assorting particles by the physical characteristics thereof, said apparatus comprising a surface for supporting a stream of particles; a wall connected to one side of said surface and projecting upwardly therefrom to support one side of the particle stream; means for vibrating said surface to impart impulses to the particles thereon for driving said particles toward the wall; said surface having a width that decreases proportionally with the length of the wall to gradually reduce the transverse section of the particle stream; a plurality of collecting compartments aligned transversely of the particle stream and in alignment with the edge of said surface opposite from that defined by said wall whereby said compartments receive particles from the surface in an order of classification with particles having similar physical characteristics being collected in the same compartment; an acceleration ramp positioned below said surface on the opposite side thereof from said wall, said ramp being downwardly inclined from said surface for a distance sufficient to enable particles gravitating down the ramp to accelerate to their maximum terminal velocity in a direction having a desired horizontal component; and said plurality of collecting compartments aligned transversely of the particle stream further including a plurality of collecting compartments aligned in the direction of particle flow from the acceleration ramp whereby particles are further separated in accordance with their size and density by their trajectories of fall from the acceleration ramp to the collecting compartments.

3,945,916
PURIFICATION OF EFFLUENT

Paul Boulenger, Grenoble, France, assignor to L' Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France

Filed June 7, 1974, Ser. No. 477,343
Claims priority, application France, June 25, 1973, 73.23073
Int. Cl.² C02C 1/08
U.S. Cl. 210—7 7 Claims



1. A process for the purification of a waste-containing liquid by oxygenation thereof with an oxygen-enriched gas in contact with a biologically activated sludge, comprising:

a. introducing raw waste-containing liquid and biologically activated sludge into an inlet zone, thereby forming a waste/sludge mixture in said inlet zone;

b. feeding the waste/sludge mixture, from the inlet zone, upwardly through a preliminary oxygenation zone and then downwardly through a descending passageway, connected to the top of the preliminary oxygenation zone, into a lower portion of a main treatment tank;

c. oxygenating the waste/sludge mixture passing through the preliminary oxygenation zone by injecting oxygen-enriched gas upwardly into the preliminary oxygenation zone;

d. recovering non-dissolved gas at the top of said preliminary oxygenation zone;

e. discharging a predetermined portion of the recovered gas to atmosphere and recycling the remainder thereof to step (c);

f. biologically treating the oxygenated waste in the treatment, entering from step (b);

g. discharging to atmosphere any gases released by said treating step (f) in the treatment tank; and

h. withdrawing a portion of the biologically activated sludge from the treatment tank and using said withdrawn sludge as at least a portion of the biologically activated sludge introduced in step (a).

3,945,917
DECOLORIZING METHOD FOR WASTE KRAFT PAPER MILL EFFLUENTS

Peter D. Foster, Columbia, Md., assignor to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 412,406, Nov. 2, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,328
Int. Cl.² C02C 5/02
U.S. Cl. 210—28 2 Claims

1. The process for decolorizing the combined total waste effluent of a pulp and paper mill at a neutral pH or higher wherein the waste effluent contains highly colored color bodies comprising the steps of:

a. measuring the original color of a combined total pulp and paper mill waste effluent containing color bodies and sulphate;

b. measuring the quantity of barium ion containing water soluble material required to produce at least about a 45% reduction in the color of the effluent;

c. adjusting the mole weight of sulphate in the waste effluent to equal or slightly exceed the mole weight of barium ion containing material determined in step (b);

d. introducing a barium ion containing water soluble material selected from the group consisting of $BaCl_2$ and $Ba(OH)_2$ under mild agitation to the waste effluent to produce a barium sulphate precipitate with the color bodies from the effluent occluded therein;

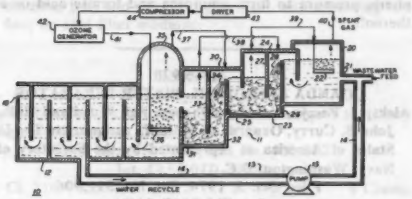
e. separating the barium sulphate precipitate and occluded color bodies from the decolorized effluent; and,

f. discharging the decolorized effluent at a final color no greater than about 300 color units to a receiving stream.

3,945,918
METHODS AND APPARATUS FOR TREATING A LIQUID WITH A GAS

Bradley S. Kirk, Warren, N.J., assignor to Airco, Inc., Montvale, N.J.

Filed Jan. 10, 1974, Ser. No. 433,015
Int. Cl.² C02C 1/38
U.S. Cl. 210—44 20 Claims



1. A method of treating a liquid exhibiting a demand for a gas comprising the steps of introducing said liquid into the initial stage of a multistage dissolution device, passing said liquid by gravity generally downwardly from one stage to the next through all stages of the device, introducing said gas into the final stage of the device to thereby establish a gas-liquid counterflow through said stages and to dissolve at least a portion of said gas in said liquid, subjecting said liquid to a confined gravitational free fall through said gas in a fall zone in at least one of said stages to create a high liquid-gas turbulence in said zone thereby effecting a mass transfer of at least a portion of said gas into said liquid, disentraining undissolved gas from said liquid after passage thereof through said zone, and passing said disentrained gas from said space generally upwardly to a previous stage of said device by the buoyancy of said gas; conducting the effluent of said device to a reaction tank wherein dissolved gas is consumed in said liquid; recycling at least a portion of the liquid in said reaction tank to the initial stage of the dissolution device to enable further dissolution of said gas in said liquid; and discharging treated liquid from said reaction tank.

11. Apparatus for treating a liquid exhibiting a demand for a gas comprising: multistage dissolution means having a plurality of serially arranged dissolution stages each of which is at a greater elevation than the following stage such that a liquid is conducted downwardly and serially therethrough; inlet means for introducing said liquid into the initial stage of said dissolution means; means for establishing a gas-liquid counterflow through all stages of said dissolution means thereby dissolving at least a portion of said gas in the liquid in each of said stages at least one of which stages comprises means for subjecting said liquid to a gravitational fall through said gas to produce a high liquid-gas turbulence whereby a mass transfer of a portion of said gas into said liquid is effected, means for disentraining undissolved gas from said liquid upon passage thereof through said fall means; and

means for passing said disentrained gas to the preceding stage of said dissolution means; a reaction tank adapted to receive liquid from the last stage of said dissolution means such that said dissolved gas is substantially consumed by said liquid in said reaction tank; and means for recycling liquid in said reaction tank to said initial stage of said dissolution means to enable further dissolution of said gas in said liquid.

3,945,919

PROCESS FOR THE ENVIRONMENTALLY FAVORABLE DESTRUCTION OF SOLID AND/OR LIQUID CYANIDE WASTE

Ulrich Schindewolf, Reichenbach, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed Aug. 2, 1972, Ser. No. 277,284
Claims priority, application Germany, Aug. 18, 1971, 2141294
Int. Cl.² C02B *1/02*; C02C *5/00*
U.S. Cl. 210—50 7 Claims

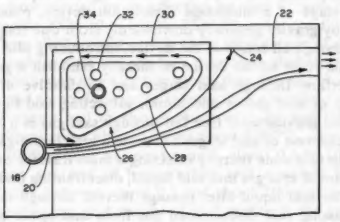
1. A process for destroying liquid or solid cyanide waste under environmentally favorable conditions consisting essentially of providing the cyanide with water in the presence of a salt of a transition metal as a catalyst and heating the aqueous mixture to a temperature of 120° to 200°C. at superatmospheric pressure to form ammonia and formic acid or a salt thereof.

3,945,920

COANDA EFFECT OIL-WATER SEPARATOR

Aleksy J. Paszyc, Ventura; Dharam Pal, Woodland Hills, and John B. Curry, Oxnard, all of Calif., assignors to The Unites States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 3, 1974, Ser. No. 511,906
Int. Cl.² B01D *21/26*
U.S. Cl. 210—73 W 3 Claims



1. A method of partially separating oil and water from an oil-water mixture comprising:

a. pumping an oil-water mixture into a bounded region between flat plates in a low flow velocity stream which attaches to a wall in said bounded region to form a Coanda separation bubble within said region;

b. extracting partially separated oil from said separation bubble; and

c. extracting partially separated water from said bounded region.

3,945,921

ROTARY CENTRIFUGAL MACHINE

Alex Toth, Lincolnwood, Ill., assignor to Ellis Corporation, Chicago, Ill.

Filed Dec. 12, 1974, Ser. No. 532,205
Int. Cl.² B01D *33/38*
U.S. Cl. 210—78 16 Claims

1. A rotary centrifugal machine comprising in combination:

casing means mounted for rotation around a rotational axis;

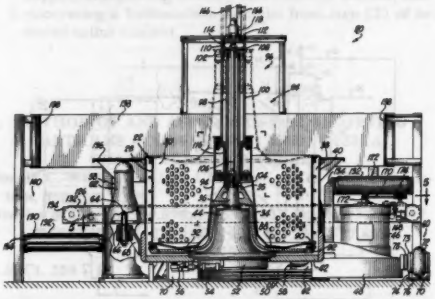
drive means for rotating said casing means;

loading conveyor means for loading material into said casing means;

sensing means for sensing a predetermined load imbalance in said casing means;

unloading means for unloading material from said casing means;

collection conveyor means for accepting unloaded material from said unloading means;



discharge conveyor means for receiving material from said collection conveyor means and for delivering material to said load conveyor means;

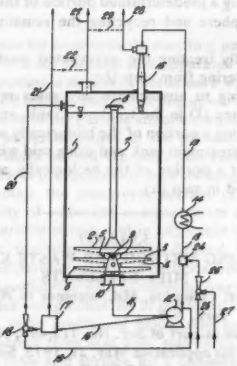
and control means operative in response to operation of said sensing means for redistributing an imbalanced load by operating said unloading means, said collection and discharge conveyor means, and said load conveyor means.

3,945,922

INSTALLATION FOR CHARGING LIQUIDS, PARTICULARLY FERMENTATION LIQUIDS, WITH GAS

Leonhard Jagusch, Leipzig, and Werner Schonherr, Neukieritzsch, both of Germany, assignors to VEB Chemieanlagenbau-und Montegekombinat, Leipzig, Germany

Filed June 20, 1974, Ser. No. 481,078
Int. Cl.² C02C *5/04*; B01D *47/00*
U.S. Cl. 210—195 R 14 Claims



1. Apparatus for gasing liquids comprising a reaction vessel for containing liquid to be gassed, a separator element located within and towards the bottom of said vessel, said separator element constituting gravity operated means effective to separate medium in the separator into a primarily gaseous phase and a primarily liquid phase, a first conduit leading from a region of said separator at which said gaseous phase accumulates upwardly to a region of said vessel above the level of

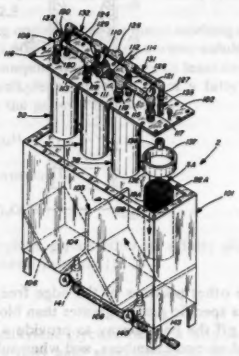
liquid therein, throttling means at the upper end of said first conduit means, second conduit means leading from a region of said separator at which said primarily liquid phase accumulates to a centrifugal pump disposed outside said vessel, said centrifugal pump having a central outlet for gas from said primarily liquid phase, third conduit means leading from said gas outlet to a second separator, fourth conduit means returning liquid from said second separator to said vessel above the level of liquid therein, said centrifugal pump having a peripheral outlet for liquid from said primarily liquid phase, fifth conduit means leading from said peripheral outlet to means disposed above the level of liquid in said vessel for entraining a gas in said liquid and for injecting said liquid and entrained gas into liquid in said vessel.

3,945,923

MODULAR WATER FILTER

Robert N. Rogers, Des Plaines, and Michael O. Saar, Addison, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 20, 1974, Ser. No. 471,255
Int. Cl.² B01D *27/06, 25/06, 25/20*
U.S. Cl. 210—253 **5 Claims**



1. A filter apparatus comprising:

a tank with a bottom, side walls, and an open top having a removable cover constructed and arranged to provide closure means for said open top;

valve means and manifold inlet means located on the upper surface of said cover and constructed and arranged to permit the introduction of fluid to be filtered through said cover at selective locations within said tank;

manifold outlet means located on the upper surface of said cover with each outlet in said cover being in fluid communication with the interior of said filter assembly located within said tank, each said filter assembly having a slotted, hollow elongate core with a closed lower end, the other end of said core being in communication with an outlet in said cover;

closed envelopes of fabric material disposed in spirally wrapped layers about the exterior of each of said cores and constructed and arranged to have interior of said envelopes in fluid communication with the slot of its respective hollow core;

baffle means connected to the bottom of said tank and extending upwardly therefrom with the upper edges thereof spaced apart from the cover of said tank and defining at least two compartments within said tank in fluid communication with each other; and,

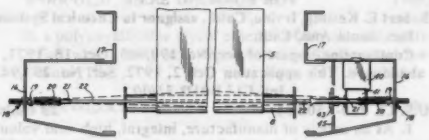
outlet means in the bottom of each compartment defined by said baffle means whereby sediment collected in the bottom of each of said compartments may be removed therefrom.

3,945,924

APPARATUS FOR IMPACT DISCHARGE OF FILTER CAKE FROM A MOVING FILTER MEDIUM AND FOR COMPACTING FILTER CAKE THEREON

C. Lynn Peterson, Salt Lake City, Utah, assignor to Peterson Filters & Engineering Company, Salt Lake City, Utah

Filed Feb. 24, 1971, Ser. No. 117,930
Int. Cl.² B01D *33/02*
U.S. Cl. 210—384 **22 Claims**



1. Apparatus for removing formed filter cake from a moving filter medium, comprising:

at least one string-like member;

structure mounting said string-like member in tension adjacent said moving filter medium; and

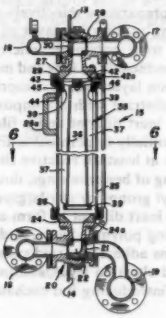
actuating means for repetitively moving said string-like member into and out of engagement with a moving surface on said filter medium.

3,945,925

FILTER DEVICE

Charles B. Nicholson, Jr., Glen Falls, N.Y., assignor to Albany Engineered Systems, Glens Falls, N.Y.

Filed Apr. 15, 1974, Ser. No. 460,882
Int. Cl.² B01D *27/00*
U.S. Cl. 210—435 **4 Claims**



1. A filter device including:

a. a longitudinally extending filter housing having an inlet and outlet;

b. means delivering fluid to be filtered to said inlet of said housing;

c. means receiving filtered fluid from said outlet of said housing;

d. a longitudinally extending filter member arranged within said housing, including:

1. a longitudinally extending, tapered baffle member;

2. a plurality of radially extending vane members spaced about said baffle and extending longitudinally thereof said vanes and the exterior of said baffle member providing flow channels open at one end and closed at the other end of said baffle;

3. said other end of said baffle being removably, fluidedly sealed within said housing to permit fluid flow to said fluid receiving means;

4. a normally non-self-supporting filter element arranged about the radially extending ends of said vanes for support thereof in spaced relation from said baffle, said filter element providing filtering flow therethrough into said flow channels.

3,945,926

INTEGRAL MICROPOROUS HIGH VOID VOLUME POLYCARBONATE MEMBRANES AND A DRY PROCESS FOR FORMING SAME

Robert E. Kesting, Irvine, Calif., assignor to Chemical Systems, Inc., Santa Ana, Calif.

Continuation-in-part of Ser. No. 190,415, Oct. 18, 1971, abandoned. This application Oct. 2, 1972, Ser. No. 293,943

Int. Cl.² B01D *31/00*

U.S. Cl. 210—500 M 23 Claims

1. As an article of manufacture, integral, high void volume polycarbonate resin membrane prepared by the dry phase inversion process being composed of polycarbonate polymer or polycarbonate-polyalkylene oxide copolymer having a molecular weight greater than about 46,000 ($\eta = 75$), and having a void volume above 65%.

3,945,927

ION-EXCHANGE GROUP BEARING COMPOSITE MEMBRANES

Satoshi Imai; Tamiyuki Eguchi, and Masaaki Shimokawa, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 361,557, May 18, 1973, Pat. No. 3,912,834. This application Sept. 10, 1974, Ser. No. 504,748

Claims priority, application Japan, June 5, 1972, 47-56266; Jan. 20, 1973, 48-9085; Sept. 14, 1973, 48-104252

Int. Cl.² B01D *39/16, 31/00*

U.S. Cl. 210—500 M 19 Claims

1. A method for preparing a selectively permeable composite membrane having an ultrathin layer of ion exchange polymer film adhered to a polymeric microporous supporting substrate which is permeable to ions and molecules which pass through said ultrathin layer, which comprises:

a. coating said substrate with a composition consisting essentially of an inert diluent and a film-forming polymer which is substantially impermeable to said substrate and which contains at least on reactive site selected from the group consisting of benzene rings, double bonds, halogen atoms, hydroxyl groups or nitrile groups;

b. removing said inert diluent to form an ultrathin layer of said film-forming polymer having a dry thickness of less than 10 microns adhered to said substrate; and

c. converting said ultrathin layer into an ion exchange layer by chemically introducing ion exchange groups into said reactive sites.

3,945,928

SERUM/PLASMA SEPARATORS WITH CENTRIFUGAL VALVES

Waldemar A. Ayres, East Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Feb. 27, 1974, Ser. No. 446,386

Int. Cl.² B01D *21/26*

U.S. Cl. 210—516 2 Claims

1. A separator device for separating mixed light phase and heavy phase constituents of blood and establishing a permanent barrier between said phases, including:

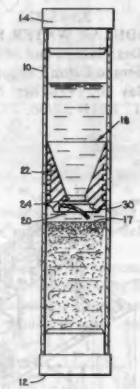
a tubular container closed at both ends and adapted to contain the blood to be separated;

elastomeric barrier means fixedly located intermediate the container ends attached to the inner side wall of the container and dividing the container into first and second chambers such that upon separation of the blood into the light phase and the heavy phase by the application of centrifugal force, the first chamber contains only the light phase;

a passageway through the barrier means connecting the first and second chambers, said barrier means further including a conical surface, adjacent the first chamber, which forms a funnel that is in communication with the passageway to facillitate the separation of the phases and the flow of the heavy phase into the second chamber;

a valve seat defined by a wall of the barrier means disposed about the passageway; and

a flexible flap valve means extending over the valve seat having one portion of the edge fixed to the barrier means



and the other portions of the edge free, the flap means having a specific gravity greater than blood and normally sealing off the passageway to provide a barrier between first and second chambers, and when subjected to a predetermined centrifugal force, the flap means flexes away from the valve seat to open the passageway to provide communication between the chambers to permit the major portion of the light phase to travel to the first chamber and the heavy solid phase to travel to the second chamber, and upon cessation of the applied centrifugal force, the flap means returns to its normal position on the valve seat to seal off the passageway and provide a barrier between the first and second chambers.

3,945,929

PROCESS FOR THE SECONDARY OR TERTIARY RECOVERY OF PETROLEUM

Fred David Martin, McMurray, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed May 8, 1974, Ser. No. 468,035

Int. Cl.² E21B *43/20, 43/22*

U.S. Cl. 252—8.55 D 8 Claims

1. A process for the secondary or tertiary recovery of petroleum from subterranean formations penetrated by an injection well and a producing well which comprises introducing into said reservoir through said injection well a displacing medium to displace said petroleum from the reservoir, said displacing medium comprising water and an aminomethylated polymer having a molecular weight of at least 200,000, said polymer being selected from the group consisting of polyacrylamide, partially hydrolyzed polyacrylamide and copolymers of acrylamide and 2-acrylamido methyl propane sulfonic acid wherein the amino substituent of the polymer is prepared from amines of the formula:

wherein R_1 and R_2 are each independently selected from alkyl groups having from 1 to 5 carbon atoms in order to increase the solution viscosity of said displacing medium.

3,945,930

WATER-SOLUBLE METAL WORKING LUBRICANTS

Noboru Sugiyama, Shizuoka; Masamichi Suzuki, Shimizu; Katami Watanabe; Keiichi Sugiyama, both of Fuji; Hachiro Tadenuma, Tokyo; Takashi Kato, Yokosuka; Ryoji Kaneda, Zushi, and Makoto Yoshino, Yokohama, all of Japan, assignors to Toho Chemical Industry Co., Ltd. and Nippon Light Metal Research Laboratory, Ltd., both of Tokyo, Japan

Filed Sept. 30, 1974, Ser. No. 510,193

Claims priority, application Japan, Sept. 29, 1973, 48-108913; Nov. 13, 1973, 48-126756

Int. Cl.[2] C10M 1/44, 3/38, 5/24, 7/24

U.S. Cl. 252—32.5 6 Claims

1. A lubricating composition for metal working comprising

A. about 10 to 60% by weight of a water-soluble non-ionic surfactant component comprising at least one of

i. a polyoxyalkylene glycol ester of a fatty acid represented by the general formula (I)

$$R^1COO(R^2O)_nH \quad (I)$$

or the general formula (II)

$$R^1COO(R^2O)_nOCR^1 \quad (II)$$

(ii) a polyoxyalkylene glycol ether of a fatty alcohol represented by the general formula (III)

$$R^3O(R^2O)_nH \quad (III)$$

iii. a polyoxyalkylene glycol ether of a fatty alcohol esterified with a fatty acid represented by the general formula (IV)

$$R^3O(R^2O)_nOCR^1 \quad (IV)$$

and

iv. a polyoxyalkylene glycol condensate of a glyceride esterified with a fatty acid represented by the general formula (V)

$$\begin{array}{l} CH_2OCR^1{}'O(R^2O)_sOCR^1 \\ | \\ CH-OCR^1{}'O(R^2O)_tR^4 \\ | \\ CH_2OCR^1{}'O(R^2O)_uR^4 \end{array} \quad (V)$$

wherein R^1CO represents a saturated or unsaturated fatty acid acyl group having about 12 to 22 carbon atoms;

$R^1{}'CO$ represents a saturated or unsaturated fatty acid acyl group having about 12 to 22 carbon atoms and containing a hydroxy group;

R^2 represents an ethylene group;

R^3 represents an alkyl or alkenyl group having about 12 to 22 carbon atoms;

R^4 represents a hydrogen atom or a R^1CO group;

n is an integer of about 10 to 20; and

p, q, r, each is an integer with the sum of p, q and r ranging from about 25 to 40 when one or both of R^4 is a hydrogen atom and from about 40 to 60 when R is a R^1CO group;

B. about 10 to 40% by weight of an oil-soluble nonionic surfactant component comprising at least one of

i. a polyoxyalkylene glycol ester of a fatty acid represented by the general formula (VI)

$$R^1COO(R^2O)_nH \quad (VI)$$

or the general formula (VII)

$$R^1COO(R^2O)_nOCR^1 \quad (VII)$$

ii. a polyoxyalkylene glycol ether of a fatty alcohol represented by the general formula (VIII)

$$R^3O(R^2O)_nH \quad (VIII)$$

iii. a polyoxyalkylene glycol ether of a fatty alcohol esterified with a fatty acid represented by the general formula (IX)

$$R^3O(R^2O)_nOCR^1 \quad (IX)$$

and

iv. a polyoxyalkylene glycol condensate of a glyceride esterified with a fatty acid represented by the general formula (X)

$$\begin{array}{l} CH_2OCR^1{}'O(R^2O)_sOCR^1 \\ | \\ CH-OCR^1{}'O(R^2O)_tR^4 \\ | \\ CH_2OCR^1{}'O(R^2O)_uR^4 \end{array} \quad (X)$$

wherein

R^1CO, $R^1{}'CO$, R^2, R^3, and R^4 are as defined above;

R^5 is an alkylene group having 2 to 4 carbon atoms;

m is an integer of about 1 to 5; and

s, t and u each is an integer with the sum of s, t and u ranging from about 3 to 20;

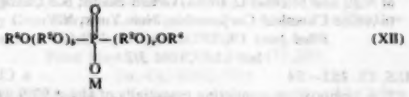
and

C. about 10 to 50% by weight of an anionic or nonionic surfactant component comprising at least one of

i. a phosphate ester and/or salt of a phosphate ester with the adduct of a polyoxyalkylene glycol with an alcohol or an alkylphenol represented by the general formula (XI)

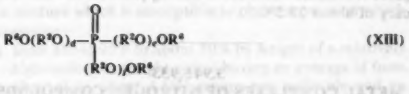
(XI)

the general formula (XII)



(XII)

or the general formula (XIII)



(XIII)

wherein R^2 is as defined above; R^6 is an alkyl group, an alkenyl group or an alkaryl group having about 12 to 18 carbon atoms;

M is an alkali metal metal atom, an alkylamine group or an alkanolamine group;

a is an integer ranging from about 2 to 15; b and c each is an integer with the sum of b and c divided by 2 ranging from about 2 to 15; and

c, d and e each is an integer with the sum of c, d and e divided by 3 ranging from about 3 to 10;

and (ii) an alkali metal salt, alkylamine salt and/or alkanolamine salt of a fatty acid represented by the

general formula (XIV)

$$R^1COOM \qquad (XIV)$$

wherein R^1CO and M are as above defined.

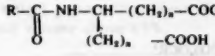
3,945,931

UTILIZATION OF AMIDO-ACIDS FOR THE PRODUCTION OF AQUEOUS FLUIDS FOR THE WORKING OF METALS

Giancarlo Bussi, and Pierpaolo Baradel, both of Trieste, Italy, assignors to Aquila S.P.A., Trieste, Italy

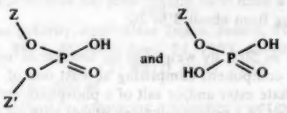
Filed Oct. 18, 1974, Ser. No. 516,030
Claims priority, application Italy, Oct. 18, 1973, 30278/73
Int. Cl.² C10M *1/44, 3/38, 5/24, 7/24*
U.S. Cl. 252—32.5 7 Claims

1. An aqueous fluid for the working of metals comprising an aqueous solution of at least one salt of an amido acid of the formula:



in which R is a hydrocarbon group substituted or not by chlorine, and having between 9 and 25 carbon atoms; n and n′ are whole numbers of zero, identical or not, whose sum $(n + n')$ is equal to 1 or 2.

2. An aqueous fluid as claimed in claim 1 further comprising in said solution, at least one salt of an ester selected from the group consisting of:



in which the groups Z and Z′ are identical or not, and include between 10 and 20 carbon atoms and including in addition a chlorine atom.

3,945,932

NOVEL TRICHLOROMONOFLUOROMETHANE-ALCOHOL AZEOTROPES

Francis J. Figiel, Boonton; Robert J. Tepper, Parsippany, both of N.J., and Michael L. Dunn, Grand Island, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed June 19, 1974, Ser. No. 480,650
Int. Cl.² C10M *3/24*
U.S. Cl. 252—54 6 Claims

1. A composition consisting essentially of about 98.9 weight percent trichloromonofluoromethane and about 1.1 weight percent ethanol which has a boiling point at 760 mm of mercury of about 23.5°C.

3,945,933

METAL COMPLEXES OF NITROGEN COMPOUNDS IN FLUIDS

Sheldon Chibnik, Cherry Hill, and Ferdinand P. Otto, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed July 31, 1974, Ser. No. 493,358
Int. Cl.² C10M *1/40, 3/34, 5/22, 7/38*
U.S. Cl. 252—33.3 15 Claims

1. A fluid composition comprising a base fluid and a minor amount sufficient to provide detergent properties thereto of the reaction product formed at temperatures of from about 20°C. to about 250°C. of (1) an alkenylsuccinic anhydride, (2) an aliphatic polyamine, (3) a metal organosulfonate and (4) a metal carboxylate containing from 1 to 30 carbon atoms.

3,945,934

XEROGRAPHIC TONER COMPOSITION

Ezekiel J. Jacob, 25 Monroe Place, Brooklyn, N.Y. 11201

Continuation-in-part of Ser. No. 100,516, Dec. 21, 1970, abandoned. This application July 16, 1973, Ser. No. 379,468
Int. Cl.² G03G *9/00*
U.S. Cl. 252—62.1 P 12 Claims

1. A xerographic toner composition comprising a stable, dry, free-flowing, self-contained intumescent electroscopic powder mixture including a thermoadhesive agent, a pigment and a dry intumescing agent incorporated therein, said intumescing agent being comprised of plastic microspheres containing occluded gas therewithin at ambient temperatures and being expandible in size upon being subjected to elevated temperature.

3,945,935

SEMICONDUCTIVE METAL CHALCOGENIDES OF THE TYPE CU_3VS_4 AND METHODS FOR PREPARING THEM

Bruce A. Torp, White Bear Lake, and Edward C. Shaffer, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 707,245, Feb. 21, 1968, abandoned. This application Oct. 29, 1971, Ser. No. 193,701
Int. Cl.² C04B *35/00;* H01L *3/00*
U.S. Cl. 252—62.3 V 17 Claims

1. An inorganic single-phase composition characterized by having the formula unit

$$Cu_3MX_4$$

wherein M is one stoichiometric equivalent containing from 1 to 3 elements selected from the group consisting of vanadium, niobium and tantalum, and X_4 is four stoichiometric equivalents and consists of one or more elements of the group consisting of oxygen, sulfur, tellurium and selenium; said composition being further characterized by having cubic crystal structure as shown by X-ray crystallographs, by containing fewer than 100 parts per million of non-dopant impurities as determined by electron probe analysis and by containing as dopant halogen of the group consisting of chlorine, bromine and iodine in amount of 0 to 100 parts per million and metal of the group consisting of arsenic and antimony in amount of 0 to 300 parts per million, said dopant materials being incorporated into the crystal lattice; said compounds having electrical resistivity in unilluminated condition of more than 10^5 ohm-centimeters and having an illuminated:unilluminated conductivity ratio of not less than about 10:1 and having broad-band photoconductive properties.

15. A process for preparing an inorganic single-phase composition characterized by having the formula unit

$$Cu_3MX_4$$

wherein M is one stoichiometric equivalent containing from 1 to 3 elements selected from the group consisting of vanadium, niobium and tantalum, and X_4 is four stoichiometric equivalents and consists of one or more elements of the group consisting of oxygen, sulfur, tellurium and selenium; said composition being further characterized by having cubic crystal structure as shown by X-ray crystallographs, by containing fewer than 100 parts per million of non-dopant impurities as determined by electron probe analysis and by containing as dopant halogen of the group consisting of chlorine, bromine and iodine in amount of 0 to 100 parts per million and metal of the group consisting of arsenic and antimony in amount of 0 to 300 parts per million, said dopant materials being incorporated into the crystal lattice; said compounds having electrical resistivity in unilluminated condition of more than 10^5 ohm-centimeters having an illuminated:unilluminated con-

ductivity ratio of not less than about 10:1 and having broadband photoconductive properties, which comprises electrically sputtering in vacuum a pellet of composition of said formula and causing the sputtered material to be deposited upon a solid substrate.

3,945,936

BLEACHING ARTICLE

Malcolm Bramel Lucas; James Francis McKenna, both of Cincinnati, and Francis Louvaine Diehl, Wyoming, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 29, 1974, Ser. No. 437,570
Int. Cl.² C11D 3/395, 7/54
U.S. Cl. 252—95 9 Claims

1. An article of manufacture especially adapted for bleaching fabrics in an automatic clothes dryer, consisting essentially of:

a. a water-insoluble, closed, flexible pouch, at least one wall of said pouch consisting of an open pore polyurethane foam having a density of from about 0.75 lb./cu. ft. to about 1.50 lb./cu. ft.; and

b. an effective amount of a solid, particulate, water-soluble fabric bleaching composition consisting essentially of a peroxygen bleach, said bleaching composition being releasably enclosed within the pouch.

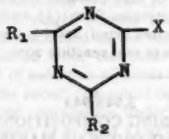
3,945,937

METHOD FOR IMPROVING THE STABILITY OF DETERGENT BLEACH COMPOSITIONS

Frederick George Villaume, Martinsville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 2, 1974, Ser. No. 457,288
Int. Cl.² C11D 7/54
U.S. Cl. 252—102 3 Claims

1. A method for the preparation of storage-stable detergent bleaching compositions containing an inorganic peroxygen bleach compound and, as an activator therefore, a substituted halotriazine compound represented by the formula:



where X represents chlorine or bromine; and R_1 and R_2 individuall; represent chlorine, bromine, hydroxy, mercapto, lower alkyl, lower alkoxy, phenoxy, dimethoxyphosphinyl, or

where R_3 and R_4 individually represent hydrogen, lower alkyl, lower cyanoalkyl, lower hydroxyalkyl or phenyl, or where R_3 and R_4 taken together complete a heterocyclic ring selected from morpholine, piperazine and piperidine rings; said method comprising forming an aqueous slurry of a detergent composition and said substituted halotriazine compound having a solids content in the range of about 50% to 65%, deaerating and spray-drying said slurry using a counter-current air flow at an inlet temperature of about 350°C. to 400°C., an outlet temperature of about 90°C. to 110°C. and a nozzle atomizing pressure in the range of 30 to 60 atmospheres, to provide a composition with a moisture content in the range of about 8 to 13% and a bulk density in the range of about 0.30 to 0.35 gram/cm³; dry blending said dried composition with said inorganic peroxygen bleach compound to provide in the storage-stable detergent composition a mole proportion of activator to peroxygen compound in the range of about 1:1 to 1:10.

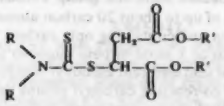
3,945,938

ANTIBACTERIAL DITHIOCARBAMATE ESTER DETERGENT COMPOSITIONS

Eugene VanNess Rowan, Rowayton, Conn., assignor to R. T. Vanderbilt Company, Inc., East Norwalk, Conn.

Filed May 7, 1974, Ser. No. 467,714
Int. Cl.² C11D 3/48, 9/50
U.S. Cl. 252—107 5 Claims

1. A bacteriostatic skin and scalp cleansing composition comprising detergent and a biostatically effective amount of a skin substantive compound of the general formula:



where R and R′ represent, independent of each other, methyl and ethyl groups provided that the total number of carbon atoms in the four alkyl groups is six or less.

4. A biostatically active detergent composition comprising at least one synthetic organic detergent selected from the group consisting of anionic, nonionic, cationic and amphoteric detergents and fatty acid soaps and a biostatically effective amount of a skin substantive, biologically active agent selected from the group consisting of S-(1,2-dimethoxycarbonylethyl) dimethyldithiocarbamate, S-(1,2-diethoxycarbonylethyl) dimethyldithiocarbamate, S-(1,2-dimethoxycarbonylethyl) diethyldithiocarbamate, and combinations thereof.

3,945,939

MIXTURES OF HIGH AND LOW MOLECULAR WEIGHT POLYOLS RESISTANT TO PHASE SEPARATION

Benny Gene Barron, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 20, 1974, Ser. No. 471,374
Int. Cl.² C08J 9/34
U.S. Cl. 252—182 12 Claims

1. A composition resistant to phase separation which comprises:

A. a mixture which is susceptible to phase separation which comprises:

1. from about 95% to about 50% by weight of a relatively high molecular weight polyol having an average of from about 2 to about 4 OH groups per molecule and an average OH equivalent weight of from about 650 to about 3000 or mixtures thereof, and

2. from about 5% to about 50% by weight of a relatively low molecular weight polyol selected from the group consisting of ethylene glycol, diethylene glycol, tetraethylene glycol, liquid polyoxyethylene glycols, 1,4-butane diol, glycerine and mixtures thereof; and

B. as a compatabilizer for Component A, a minor but effective quantity of colloidal silica, or an onium modified clay or mixtures thereof, present in an amount of from about 0.2% to about 3% by weight of component (A).

3,945,940

PREPARATION OF ALDEHYDE AND KETONE ORGANIC PEROXIDE COMPOSITIONS

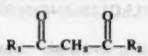
Newton G. Leveskis, Walnut Creek, Calif., assignor to Argus Chemical Corporation, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 702,782, Feb. 5, 1968, which is a continuation-in-part of Ser. No. 473,855, July 21, 1965, abandoned. This application June 4, 1970, Ser. No. 43,329

Int. Cl.[2] C07C 179/06; A61L 13/04

U.S. Cl. 252—186 26 Claims

1. An organic peroxide especially suitable for the room temperature curing of polyester resins made by the process comprising: concurrently reacting a beta dione of up to about 20 carbon atoms of the structure:



in which R_1 and R_2 are individually selected from the group consisting of alkyl, cycloalkyl, and aryl with a different carbonyl compound selected from the group consisting of ketones and aldehydes of up to about 20 carbon atoms free from aliphatic unsaturation and containing only carbon, hydrogen, and oxygen in a ratio of 1 mole of beta dione to about 3–20 equivalent weights of said different carbonyl compound based upon the number of co-reactive carbonyl groups therein in an acidic hydrophilic fluid media containing sufficient aqueous hydrogen peroxide to form appreciable amounts of organic peroxides therewith.

3,945,941

HAZARD REDUCTION FOR BULK SHIPMENT QUANTITIES OF AQUEOUS TERTIARY BUTYL HYDROPEROXIDE

Alfred E. Borchert, Cherry Hill, N.J.; Eugene C. Capaldi, Broomall, Pa., and Donnell A. Ballard, Princeton, N.J., assignors to Oxirane Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 347,967, April 4, 1973, abandoned. This application Jan. 7, 1975, Ser. No. 539,196

Int. Cl.[2] A62C 3/12; B65D 8/24; C07C 179/02

U.S. Cl. 252—186 6 Claims

1. The method of inhibiting troublesomely rapid combustion of a body of aqueous tertiary butyl hydroperoxide suitable for bulk shipment in a tank which method consists essentially of associating bulk-shipment sized body of aqueous tertiary butyl hydroperoxide consisting essentially of 30 percent water and 70 percent tertiary butyl hydroperoxide with a minor amount of polyolefin having a melt index within the range from 0.2 to 10, said polyolefin being selected from the group consisting of polyethylene and polypropylene, said method providing a metal container having said minor amount of polyolefin present as a liner having a thickness within the range from about 0.7 to 7 mm., and the aqueous tertiary butyl hydroperoxide being stored within such lined container.

3. The method of inhibiting troublesomely rapid decomposition during the terminal stages of combustion of a body of aqueous tertiary butyl hydroperoxide suitable for bulk shipment in a tank which method consists essentially of associating bulk-shipment sized body of aqueous tertiary butyl hydroperoxide consisting essentially of 30 percent water and 70 per cent tertiary butyl hydroperoxide with a minor amount of polyolefin having a melt index within the range from 0.2 to 10, said polyolefin being selected from the group consisting of polyethylene and polypropylene, said method providing a metal container having said minor amount of polyolefin present as a liner having a thickness within the range from about 0.7 to 7 mm., and the aqueous tertiary butyl hydroperoxide being stored within such lined container, said polyolefin containing a hazard reducing quantity of radical trap of the group consisting of alkyl phenols, phenothiazines, substitute naphthyl amines, phenylene diamines, dibenzyl amine, and iminodibenzyl, the quantity of said radical trap constituting from about 10 to about 100,000 parts per million parts of aqueous tertiary butyl hydroperoxide, whereby such combination burns safely to extinction without troublesomely rapid decomposition.

3,945,942

FUEL BURNER AND PROCESS FOR GAS MANUFACTURE

Charles P. Marion, Mamaroneck, N.Y., and Blake Reynolds, Riverside, Conn., assignors to Texaco Development Corporation, New York, N.Y.

Division of Ser. No. 186,207, Oct. 4, 1971, Pat. No. 3,758,037. This application Oct. 30, 1972, Ser. No. 302,167

Int. Cl.[2] C01B 1/16, 2/02

U.S. Cl. 252—373 5 Claims

1. In a continuous process for the manufacture of gas mixtures rich in hydrogen and carbon monoxide by the partial oxidation of a reactant stream selected from the group consisting of gaseous hydrocarbon fuel, liquid hydrocarbon fuel, and pumpable slurries of solid carbonaceous fuel with a reactant stream of oxygen-rich gas selected from the group consisting of air, oxygen-enriched air containing more than 21 mole % oxygen, and substantially pure oxygen containing more than 95 mole % oxygen in an amount providing a weight ratio of free oxygen to carbon in the feed stock in the range of 0.7 to 1.5, and in the presence of a temperature moderator selected from the group consisting of steam, atomized liquid water, CO_2, cooled portion of product gas, cooled off-gas from an ore-reduction zone, inert gas such as nitrogen, and mixtures thereof; said partial oxidation reaction occurring in the reaction zone of a free flow gas generator at an autogenous temperature in the range of about 1700° to 3500°F and at a pressure in the range of about 1 to 250 atmospheres, the improvement which comprises (1) splitting one of said reactant streams optionally in admixture with a portion of said temperature moderator into a plurality of smaller streams flowing through tubes parallel to each other and without touching each other in a symmetrically spaced bunch; (2) simultaneously passing in the same direction as said streams of first reactant said other reactant stream optionally in admixture with a portion of said temperature moderator into the interstices between each of said plurality of parallel tubes; (3) mixing the reactant streams from (1) and (2) together to produce a well distributed blend; and (4) burning the mixture from (3) downstream in said reaction zone.

3,945,943

ZEOLITE CONTAINING COMPOSITIONS, CATALYSTS AND METHODS OF MAKING

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 191,123, Oct. 20, 1971, abandoned. This application Oct. 15, 1973, Ser. No. 406,225

Int. Cl.[2] B01J 29/06

U.S. Cl. 252—455 Z 15 Claims

1. A hydrocarbon conversion catalyst comprising a particle-form aggregate of about 2–90% by weight of a stabilized, rare earth metal-free crystalline aluminosilicate zeolite component and about 10–98% by weight of an amorphous refractory inorganic oxide component selected from the class consisting of alumina, silica, magnesia, beryllia, zirconia, titania, thoria, chromia, and combinations thereof, said catalyst having been prepared by:

a. ion exchanging a crystalline alkali metal aluminosilicate zeolite having a SiO_2/Al_2O_3 ratio above 3 with ammonium ions under exchange conditions adjusted to reduce the alkali metal content of said zeolite to less than about 3 weight percent determined as the metal and replace between about 20% and 95% of the original alkali metal content of said zeolite with ammonium ions;

b. steaming the resultant exchanged zeolite at a temperature of about 800° to about 1650°F in the presence of at least about 0.5 psi water vapor partial pressure for at least

about 10 minutes, sufficient to convert said exchanged zeolite to the corresponding hydrogen form and stabilize said zeolite, said steaming being carried our prior to any calcination of said exchanged zeolite under anhydrous conditions and prior to the addition of said amorphous refractory inorganic oxide component;

c. re-exchanging the resultant stabilized zeolite with ammonium ions under conditions sufficient to further reduce said alkali metal content to less than about 2 weight percent determined as the corresponding oxide and to introduce into said zeolite an amount of ammonium ions corresponding to at least about 5 percent of the original ion exchange capacity of said zeolite; and

d. forming the re-exchanged zeolite into a particle-form aggregate containing said refractory oxide intimately admixed therein, and calcining said aggregate at a temperature of at least about 600°F.

3,945,944

CATALYST FOR THE PRODUCTION OF HYDROGEN AND/OR METHANE

Chia-Chen Chu Kang, 301 Gallup Road, Princeton, N.J. 08540

Continuation-in-part of Ser. No. 203,847, Dec. 1, 1971, abandoned. This application Feb. 8, 1974, Ser. No. 440,824

Int. Cl.² B01J *29/06, 29/10*

U.S. Cl. 252—455 R **5 Claims**

1. A substantially alkali-free, heat treated catalyst composition for the production of gases rich in hydrogen or methane with decreased carbon lay-down prepared by a method which comprises:

supporting on a refractory material having a surface area of at least one square meter per gram and selected from oxides of aluminum, silicon, magnesium, calcium, titanium or mixtures thereof

a. between about 5 and about 70 weight percent basis the total catalyst weight and calculated as the metal of a nickel compound selected from elemental nickel, a reducible compound of nickel or mixtures thereof;

b. at least 0.5 weight percent basis the total catalyst weight and calculated as the metal of a cobalt compound selected from elemental cobalt, a reducible compound of cobalt or mixtures thereof;

after support of the cobalt compound on the refractory, heat treating the catalyst composition under non-reducing conditions at a temperature of at most 1100°F.

3,945,945

HIGH SURFACE AREA ALUMINA BODIES

Joseph R. Kiovsky, and Jeffrey W. Meacham, both of Kent, Ohio, assignors to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 142,004, May 10, 1971, abandoned. This application Jan. 16, 1973, Ser. No. 324,106

Int. Cl.² B01J *21/04*

U.S. Cl. 252—463 **3 Claims**

1. A method for bonding platy particulate boehmite to produce monolithic bodies having a surface area between 10 and 300 square meters per gram for use as catalysts, catalyst carriers and adsorbents comprising:

mixing microcrystalline boehmite with a dilute aqueous solution of monobasic acid in which the anion has a ionic size no larger than that of propanoic acid to promote the dispersion of the boehmite into platelets and to form a free flowing mixture consisting of spheroidal aggregates and being relatively dry and uncompacted; and

forming bodies by compaction prior to any significant rebonding of said dispersed platelets and drying and firing said compacted bodies.

3,945,946

COMPOSITIONS AND METHODS FOR HIGH TEMPERATURE STABLE CATALYSTS

Saul G. Hindin, Mendham, and Joseph C. Dettling, Jackson, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Filed Dec. 10, 1973, Ser. No. 423,095

Int. Cl.² B01J *23/16*

U.S. Cl. 252—465 **20 Claims**

1. A catalyst composition characterized by a surface area of at least 20 m^2/g after calcination for two hours at 1200° C. consisting essentially of (a) a catalytically-active, calcined composite consisting essentially of alumina, and a mixture of two metal components wherein the first component is selected from the group consisting of an oxide of chromium, tungsten, and mixtures thereof and the second component is selected from the group consisting of an oxide of a Group IVB metal, and mixtures thereof, and (b) a catalytically-effective amount of platinum group metal added thereto after calcination of said composite at a temperature of at least 850° C.

3,945,947

CATALYST FOR PURIFYING EXHAUST GASES

Toshiyuki Sakai, Funabashi; Kazuhide Miyazaki, Tanashi, and Michiaki Yamamoto, Hino, all of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Jan. 8, 1973, Ser. No. 321,822

Claims priority, application Japan, Jan. 14, 1972, 47-5882

Int. Cl.² B01J *21/04, 23/42, 23/44*

U.S. Cl. 252—466 B **2 Claims**

1. A single catalyst bed for purifying exhaust gases from combustion operations by transforming CO, hydrocarbons and nitrogen oxides into harmless substances, consisting essentially of two catalyst components A and B, wherein

component A consists essentially of at least one metal selected from the group consisting of Pd and Pt, said metal being supported on an inert catalyst carrier, and component B consists essentially of 5 to 10 parts by weight of Mn_2O_3, 10 to 20 parts by weight of CuO, 5 to 10 parts by weight of Fe_2O_3, 60 to 80 parts by weight of gamma aluminum oxide and 1 to 5 parts by weight of MgO.

3,945,948

CATALYST AND THE PROCESS FOR PREPARING IT

Walter Westwood, and John Blunden Payne, both of London, England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Dec. 19, 1973, Ser. No. 426,198

Claims priority, application United Kingdom, Dec. 22, 1973, 59342/72

Int. Cl.² B01J *23/46, 23/64*

U.S. Cl. 252—472 **5 Claims**

1. A catalyst consisting essentially of a mixed oxide obtained by coprecipitating ruthenium and a base metal as hydrated oxides from a solution of ruthenium salt and salt of a base metal selected from the group consisting of titanium, zirconium, hafnium, niobium and bismuth drying and calcining to form said mixed oxide.

3,945,949

ALKALI METAL VAPOUR GENERATOR

Johannes Hendrikus Nicolaas Van Vucht, and Jan Josephus Bernardus Fransen, both of Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed June 7, 1973, Ser. No. 367,946

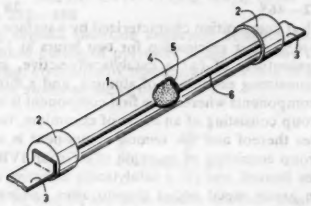
Claims priority, application Netherlands, June 15, 1972, 7208146

Int. Cl.² H01B *1/02;* **H01J** *9/395*

U.S. Cl. 252—514 **4 Claims**

1. An alkali metal vapour generator comprising a material which consists essentially of at least one alkali metal and a further metal having a lower vapour pressure than said alkali

metal, said further metal consisting essentially of at least one element selected from the group consisting of gold, silver and



copper, with the proviso that said further metal include at least one of gold and silver.

3,945,950

SOLID PERFUMED COMPOSITIONS OF MATTER

Jean-Jacques Vosganiantz, Amboise, France, assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Oct. 2, 1974, Ser. No. 511,157

Int. Cl.² C11B 9/00

U.S. Cl. 252—522 9 Claims

1. A solid perfumed composition of matter comprising a mixture of a gelling agent, inert liquids, an aromatic composite and a mono(C_1 to C_4 alkyl) ether of diethylene glycol, said aromatic composite and said ether being of similar volatility and said ether being present in the solid composition in greater amount than said aromatic composite.

3,945,951

YELLOWING-PREVENTIVE DETERGENT COMPOSITION

Haruhiko Arai, Narashino; Junryo Mino, Kamagaya, and Kimie Ide, Tokyo, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

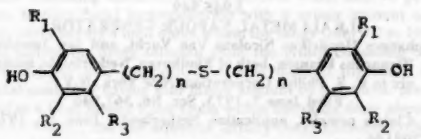
Filed Sept. 21, 1973, Ser. No. 399,754

Claims priority, application Japan, Sept. 26, 1972, 47-96447

Int. Cl.² C11D 1/12

U.S. Cl. 252—546 7 Claims

1. A clothes washing detergent composition having incorporated therein from 0.001 to 5 percent by weight of a compound of the formula



wherein n is 0 or 1, R_1 is an aliphatic hydrocarbon having 8 to 14 carbon atoms or tert.-butyl, and R_2 and R_3 are H, alkyl or hydroxyalkyl having 1 to 2 carbon atoms, with the proviso that at least one of R_2 and R_3 is said alkyl or hydroxyalkyl.

3,945,952

NOVEL RESINOUS MATERIAL BY REACTION OF EPOXY COMPOUNDS AND POLYGLUTAMIC ACID SALTS

Yasuo Fujimoto, Yokohama; Keizo Tatsukawa, Machida; Koichi Nagaoka, Nishinomiya; Masayuki Nagumo, Tokyo, and Kiichi Nagai, Nagoya, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd, Japan

Filed Sept. 27, 1972, Ser. No. 292,783

Claims priority, application Japan, Oct. 1, 1971, 46-76254; Jan. 10, 1972, 47-4654

Int. Cl. C08g 30/14

U.S. Cl. 260—2 N 20 Claims

1. A novel resinous material which is obtained by reacting an epoxy compound which has at least two 1,2-epoxy groups with a salt selected from the group consisting of ammonium, lithium, sodium, potassium and magnesium salts of polyglutamic acid, said salt being water-soluble and having a molecular weight of 2,000 to 500,000.

2. The resinous material of claim 1, wherein said epoxy compound is selected from the group consisting of glycidyl ethers of bisphenol A, resorcinol, bisphenol F, fetrakis-(hydroxyphenyl)ethane type, novolacs, oxyalkylene glycols, glycerol or a, polyolefin and alicyclic epoxy compounds and soybean oil epoxides, said epoxy compound consisting of carbon, hydrogen and oxygen.

3,945,953

ω,ω'-BIS-[4-AMINO-3-AMINOMETHYL-PIPERIDYL-(1)]-LKANES, PROCESS FOR THEIR MANUFACTURE AND THEIR USE

Helmut Zondler, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 348,797, April 6, 1973, abandoned. This application Aug. 23, 1974, Ser. No. 499,937

Claims priority, application Switzerland, Apr. 21, 1972, 5930/72

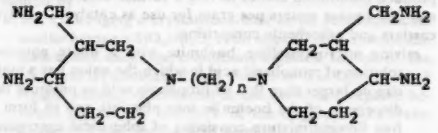
Int. Cl.² C08G 59/50

U.S. Cl. 260—2 N 9 Claims

1. A curable mixture which is suitable for the manufacture of moulded articles, impregnations, coatings and bonds, which contains

a. one polyepoxide compound with on average more than one 1,2-epoxide group in the molecule, and

b. as hardener a ω,ω'-bis[4-amino-3-aminomethyl-piperidyl-(1)]-alkane of the general formula



wherein *n* is a number from 2 to 6.

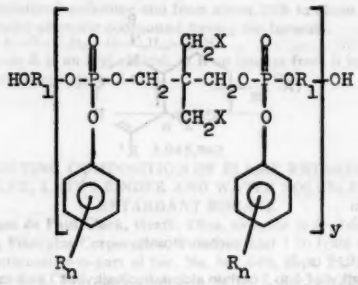
3,945,954

FLAME RETARDANT POLYURETHANES FROM POLYMERIC HALOGENATED ORGANO PHOSPHOROUS DIOLS

Wadim Batorewicz, New Haven, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 432,703, Jan. 11, 1974, Pat. No. 3,882,199. This application Oct. 31, 1974, Ser. No. 519,441
Int. Cl.² C08G 18/14, 18/32
U.S. Cl. 260—2.5 AR 3 Claims

1. A flame retardant polyurethane material resulting from the interaction of an organic polyisocyanate and a polyol material comprising a polymeric organophosphorus ester diol having the structure



wherein R may be:

a. hydrogen, chlorine, or bromine;

b. an alkyl, haloalkyl, or alkoxy radical having from one to six carbon atoms;

wherein *n* may vary from 1 to 3; wherein R_1 may be: a branched or linear alkylene, alkenylene, alkynylene or alkoxyalkylene radical containing from two to ten carbon atoms, optionally containing bromine or chlorine substituents; wherein X may be chlorine or bromine; and wherein *y* has a value of from 1 to 7.

2. A flame retardant polyurethane material as set forth in claim 1, said polyurethane material being a foam.

3,945,955

PLASTICIZED POLYVINYL CHLORIDE COMPOSITIONS CONTAINING SILICONE FROTHING AGENTS

Frederick J. Ihde, Jr., Mountain Lakes, N.J., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Dec. 16, 1974, Ser. No. 533,157
Int. Cl.² C08J 9/00
U.S. Cl. 260—2.5 P 14 Claims

1. A composition for producing a foam by mechanically whipping comprising:

a. a plastisol which is a mixture of

1. a particulate resin selected from the group consisting of a vinyl chloride homopolymer and a vinyl chloride copolymer of a major portion of a vinyl chloride monomer and a minor portion of a copolymerizable dissimilar vinyl comonomer, and

2. a high boiling organic liquid plasticizer which is substantially a non-solvent for the particulate resin at room temperature but is capable of dissolving the particulate resin at elevated temperature to form a single phase material which upon cooling to room temperature is a solid material,

b. from about 1 to about 5 phr of a silicone frothing agent, and

c. from about 5 to about 10 phr of an oleophilic frothing aid which is a stable, homogeneous mixture of

1. at least one member selected from the group consisting of a metal phenate, a metal soap, a metal organosulfonate, a metal organophosphonate and a metal organothiophosphonate wherein the metal is selected from the group consisting of sodium, potassium, lithium, barium, calcium, strontium, cesium, magnesium, lead and tin, the member being oleophilic or forming an oleophilic reaction product with another component present in the composition, and

2. at least one member selected from the group consisting of a free acid of a phosphate ester, a free acid of a phosphite ester, a borate ester, an amine, an amine salt of a sulfonic acid and an alkyd resin wherein the ester moiety in the phosphate ester, phosphite ester and borate ester is alkyl, alkenyl, aryl, substituted alkyl, substituted alkenyl, substituted aryl or an alkoxylate thereof.

3,945,956

POLYMERIZATION OF STYRENE ACRYLONITRILE EXPANDABLE MICROSPHERES

Joseph L. Garner, Sanford, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 23, 1975, Ser. No. 589,323
Int. Cl.² C08J 9/18, 9/16
U.S. Cl. 260—2.5 B 3 Claims

1. In a method for the preparation of expandable styrene-acrylonitrile microspheres, wherein the styrene-acrylonitrile microspheres comprise a generally hollow spherical shell of a copolymer of from about 50–80 parts by weight styrene and from about 50–20 parts by weight of acrylonitrile, from 10–50 parts by weight of a volatile liquid blowing agent which on heating, boils under atmospheric pressure at a temperature below the glass temperature of the polymer shell wherein styrene, acrylonitrile, volatile fluid foaming agent, a free radical polymerization initiating catalyst, a suspending agent suitable for an encapsulating polymerization system and an aqueous suspending medium are admixed to provide a dispersion of droplets containing styrene, acrylonitrile and volatile fluid foaming agent are dispersed within the aqueous suspending medium, causing free radical polymerization of the styrene and acrylonitrile to form expandable styrene-acrylonitrile microspheres, the improvement which comprises employing from about one-half to about 10 parts by weight per 100 parts by weight of water, in the suspending medium, of a hydroxyl containing compound of the formula:

$$R - (OH)_n$$

wherein R is an alkyl radical containing up to about 6 carbon atoms and *n* is an integer of from 1–4 inclusive.

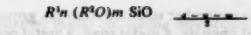
3,945,957

DRY PLANOGRAPHIC PRINTING INK COMPOSITION

Atsumi Noshiro, Tsurumi, and Yoshio Inoue, Annaka, both of Japan, assignors to Dai Nippon Printing Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1974, Ser. No. 516,085
Claims priority, application Japan, Oct. 26, 1973, 48-119834
Int. Cl.² B41M 1/00; C09D 11/10; G03F 7/02
U.S. Cl. 260—3.3 18 Claims

1. A dry planographic printing ink composition which comprises a vehicle for an ink, a pigment and a solvent, characterized by using as a portion of the vehicle 1 to 40% by weight of a silicone modified alkyd resin containing 5 to 50% by weight of an organopolysiloxane represented by the average composition formula:



wherein R^1 is a monovalent unsubstituted hydrocarbon group having 1 to 4 carbon atoms, R^2 is a hydrogen atom or a monovalent hydrocarbon group having 1 to 4 carbon atoms, n is an integer of 1.0 to 2.0, and m is an integer of 0.1 to 2.5, $n+m$ being less than 4, said vehicle being selected from the group consisting of drying oil, synthetic drying oil, rosin, copal, dammer, shellac, hardened rosin, rosin esters, phenolic resins, rosin-modified phenolic resins, maleic acid resins, alkyd resins, petroleum resins, vinyl resins, polyamide resins, epoxy resins, aminoalkyd resins, polyurethane resins, aminoplast resins, nitrocellulose, ethyl cellulose, chlorinated rubber, cyclized rubber, glue, casein, dextrin and zein.

3,945,958

METHOD FOR SUSPENSION-POLYMERIZING VINYL CHLORIDE

Shunichi Koyanagi, Yokohama; Hajime Kitamura, Tokyo, and Toshihide Shimizu, Ibaragi, all of Japan, assignors to Shinetsu Chemical Company, Tokyo, Japan

Continuation of Ser. No. 258,446, May 31, 1972, abandoned. This application May 31, 1974, Ser. No. 475,052

Int. Cl.² C08F 2/20

U.S. Cl. 260—17 A **6 Claims**

1. In a method for suspension-polymerizing, in an aqueous medium containing a polymerization initiator and a suspending agent, vinyl chloride or a mixture of monomers containing vinyl chloride as a main component, the improvement in which the suspending agent comprises a mixture of two water soluble cellulose ethers wherein the first water soluble cellulose ether has a viscosity of no more than 100 cps at 20°C and the second water soluble cellulose ether has a viscosity of at least 400 cps at 20°C, the viscosities being of a 2% aqueous solution, said ethers being present in the ratio of about 1:4 to 4:1 by weight, and in a total amount of 0.01 to 0.05% by weight based on the weight of monomer charged and said water soluble cellulose ethers being selected from the group consisting of methylcellulose, ethylcellulose, hydroxypropylcellulose, hydroxyethyl methylcellulose, and hydroxypropyl methylcellulose.

3,945,959

OIL MODIFIED IMIDIZED POLYESTER RESINS

Daniel J. Lange, St. Louis, Mo., assignor to The P. D. George Co., St. Louis, Mo.

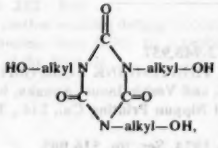
Filed July 17, 1974, Ser. No. 489,382

Int. Cl.² C09D 3/56, 3/64, 3/66

U.S. Cl. 260—20 **40 Claims**

1. An oil-modified imidized polyester resin of polyester of

I. an isocyanate of the formula



II. a phthalic acid,

III. a member selected from the group consisting of (1) fatty acids, (2) fatty oils, (3) mono- and di-glycerides of the fatty acis and (4) mixtures thereof, and

IV. an aromatic tricarboxylic acid and a diamine capable of reacting with each other to form an imide,

the isocyanurate being the sole polyol component present in the polyester apart from that occurring in the component (III), there being no other polymer forming components in the said resin other than those selected from the above named components.

11. A composition comprising the resin of claim 1 with a phenol-aldehyde resin.

3,945,960

ANTIINFLAMMATORY AND ANALGESIC CYCLOALKANO-PYRIMIDIN-2(1H)-ONES

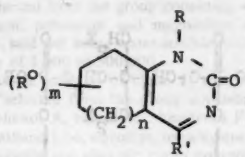
William G. Salmond, Kalamazoo, Mich., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed July 26, 1973, Ser. No. 382,721

Int. Cl.² C07D 239/82

U.S. Cl. 260—251 A **12 Claims**

1. A compound of the formula:



wherein

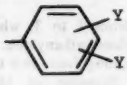
n is 2 to 7,

R^o is alkyl of 1 to 3 carbon atoms,

m is 0, 1 or 2.

R is alkyl of 1 to 5 carbon atoms, cycloalkyl of 3 to 8 carbon atoms or cycloalkylalakyl of 4 to 10 carbon atoms in which the alkyl is of 1 to 3 carbon atoms and the cycloalkyl of 3 to 8 carbon atoms, and

R′ is a radical of the formula:



in which Y and Y′ are independently hydrogen, fluoro, chloro, alkyl of 1 or 2 carbon atoms, alkoxy of 1 to 2 carbon atoms or one of Y and Y′ is trifluoromethyl while the other is hydrogen, or a radical of the formula:

in which Y′ is hydrogen, fluoro, chloro or alkyl of 1 to 3 carbon atoms.

3,945,961

NOVEL CROSS-LINKING AGENTS AND THEIR USE IN ELECTROPHORETIC COATING COMPOSITION

Werner Josef Blank, Wilton, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 418,139, Nov. 21, 1973, Pat. No. 3,894,993, which is a continuation of Ser. No. 302,957, Nov. 1, 1972, abandoned, which is a continuation of Ser. No. 130,531, April 1, 1971, abandoned. This application Jan. 23, 1975, Ser. No. 543,396

Int. Cl.² C08L 61/20

U.S. Cl. 260—29.4 UA **7 Claims**

1. In an electrophoretic coating composition comprising, in aqueous dispersion, a mixture of from about 5% to about 40%, by weight, of (A) an aminoplast condensation product and, correspondingly, from about 95% to about 60%, by weight, of (B) a water-dispersible, non-gelled, polymeric material carrying an ionic charge, which polymeric material contains at least

one class of reactive groups selected from the group consisting of carboxyl groups, alcoholic hydroxy groups and amide groups, said ionic charge is derived from the polymeric material containing said reactive groups wherein the amount of said groups is at least about 3%, by weight, and not more than about 30%, by weight, based on the total weight of said polymeric material, wherein said groups are heat reactive with (A), and wherein said percentages of (A) and (B), by weight, total 100% and are based on the total solids weight of (A) and (B); the improvement comprising, as said condensation product, the heat reaction product prepared by reacting at a temperature of at least 100°C in an acidic medium from about 90% to about 30% of a substantially water-insoluble, substantially fully etherified, substantially fully methylolated guanamine or substantially fully etherified, substantially fully methylolated melamine and from about 10% to about 70% of alkylated phenolic compound having the formula:

$$R-O-C_nH_{2n}-O-C_nH_{2n}-_mOH$$

wherein R is an aryl radical, *m* is an integer from 0 to 3, and *n* is an integer from 2 to 4.

3,945,962
COATING COMPOSITION OF FLAME RETARDANT FILLER, LATEX BINDER AND WATER SOLUBLE FIRE RETARDANT BORATE

Vincent de Paul Clark, Heath, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 862,040, Sept. 29, 1969, abandoned. This application Dec. 6, 1971, Ser. No. 205,288

Int. Cl.² C08L *31/04, 23/06, 33/08*

U.S. Cl. 260—29.6 MM **7 Claims**

1. A coating composition for use on fibrous glass thermal insulation comprising an aqueous dispersion of coating solids, said solids, by weight, consisting essentially of:

a. 70 to 90% of a flame retardant filler selected from the group consisting of aluminum hydrate or magnesium hydrate or a combination thereof;

b. 5 to 20% of a binder selected from the group consisting of a latex of a copolymer of vinyl acetate and butyl acrylate, a copolymer of vinyl acetate and ethylene or a combination thereof; and

c. 1 to 10% of a water soluble fire retardant borate selected from the group consisting of sodium borate or boric acid or a combination thereof.

3,945,963
WATER-BASED EPOXY ACRYLIC COATING COMPOSITIONS

Morris Levine, Cleveland Heights; Michael Yurcheshen, Parma Heights, and Roland W. Hight, Brook Park, all of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 7, 1974, Ser. No. 431,449

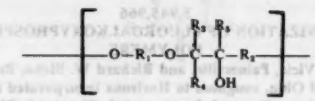
Int. Cl.² C08L *63/10*

U.S. Cl. 260—29.6 NR **19 Claims**

1. A coating composition comprising an emulsion of a partially-solubilized polymeric binder in water, wherein the polymeric binder comprises:

A. from about 25 to about 75 percent by weight of polymer solids of an acrylic interpolymer derived from an alkyl acrylate or methacrylate ester, an ethylenically unsaturated carboxylic acid and, optionally, at least one other copolymerizable ethylenically-unsaturated monomer, wherein at least part of the acid carboxylic groups have been iminated with an alkylenimine, wherein said interpolymer is partially solubilized with a solubilizing agent, and wherein said acrylic interpolymer prior to partial solubilization with said solubilizing agent has an acid number of from about 20 to about 100; and

B. from about 25 to about 75 percent by weight of polymer solids of a high molecular weight epoxy resin having the structure:



wherein *n* is an integer sufficient to provide the resin with a molecular weight of at least about 20,000; R_1 is a divalent aromatic radical selected from the group consisting of bisphenol A, substituted bisphenol A, bisphenol F, and substituted bisphenol F; R_2 is a C_1 to C_8 alkyl; and R_3, R_4 and R_5 are individually selected from the group consisting of hydrogen and a C_1 to C_5 alkyl.

3,945,964
AQUEOUS EPOXY EMULSIONS

Garth Winton Hastings, 23 Belair Ave., Carringbah, and Wade Arthur Wyatt, 173 High St., Willoughby, both of Australia

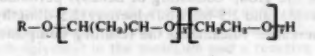
Continuation-in-part of Ser. No. 400,518, Sept. 25, 1973, abandoned, which is a continuation of Ser. No. 234,639, March 14, 1972, abandoned. This application May 10, 1974, Ser. No. 468,657

Claims priority, application Australia, Mar. 19, 1971, 4365/71; Oct. 15, 1971, 6668/71

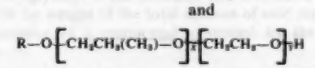
Int. Cl.² C08J *3/06, 9/28*

U.S. Cl. 260—29.6 NR **6 Claims**

1. A stable aqueous emulsion of an epoxy resin, said emulsion containing, as an emulsifying agent, between 2 and 10% by weight relative to the weight of the epoxy resin, of an ethylene oxide-propylene oxide block copolymer having the formulae:



and



in which formulae X is an integer of at least 8 and at most 22, Y is an integer of at least 25 and at most 40, and R is a radical selected from the group consisting of alkenyl, aralkyl, cycloalkyl, aralkenyl and cycloalkenyl radicals.

3,945,965
MIXTURES OF TITANIUM DIOXIDE AND POROUS SYNTHETIC MAGNESIUM SILICATE IN OPACIFIED EMULSION PAINTS

Alexander Ramig, Jr., Brunswick, and Stephen T. Bowell, North Olmsted, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed May 24, 1974, Ser. No. 472,979

Int. Cl.² C08J *3/20*

U.S. Cl. 260—29.6 MM **2 Claims**

1. In an opacified aqueous dispersion paint composition having film-forming latex binder and between about 5% and 50% opacifying pigment on a dry solid volume basis, the improvement comprising:

said opacifying pigment comprising titanium dioxide and porous synthetic magnesium silicate wherein said paint contains between about 1% to 30% of said porous synthetic magnesium silicate on a dry solid volume basis, said porous synthetic magnesium silicate having a porosity of between about 30% and 80% by volume and pore diameters between about 0.03 microns and 0.9 microns, said porous magnesium silicate having an average particle size between about 5 to 20 microns; and

said film-forming latex binder particles being between about 1000 A and 10,000 A.

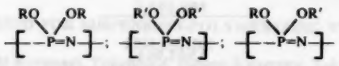
3,945,966

VULCANIZATION OF FLUOROALKOXYPHOSPHAZENE POLYMERS

John C. Vicic, Painesville, and Richard W. Sicka, Brecksville, both of Ohio, assignors to Horizons Incorporated a division of Horizons Research Incorporated, Cleveland, Ohio

Filed May 29, 1974, Ser. No. 474,320
Int. Cl.[2] C08K 9/06
U.S. Cl. 260—42.15 19 Claims

1. A process for the production of thermally stable, fluid resistant vulcanized polyphosphazene copolymers, terpolymers and mixtures thereof which comprises mixing 100 parts by weight of unvulcanized elastomeric polyphosphazene polymer represented as consisting of randomly distributed repeating units having the following formulae



in which OR and OR′ are selected from the group consisting of

fluoroalkoxy groups represented by the formula $Z(CF_2)_nCH_2O-$ wherein Z represents H or F and n is an integer between 2 and 9 and aryloxy groups with:

0.1 to 20 parts by weight of a coagent which is at least trifunctional and taken from the class of compounds which contain allyl, vinyl, propenyl, acrylate, or methacrylate moieties on aliphatic or aromatic or heterocyclic nuclei;

20 to 150 parts by weight of a reactive silane treated clay or aluminum silicate filler;

up to 10 parts by weight or metal oxide selected from the group consisting of MgO, ZnO, ZrO_2, or $BaZrO_3$;

up to 10 parts by weight of a vulcanizing agent selected from the group consisting of benzoyl peroxide, dicumyl peroxide, and 2,5-bis(t-butylperoxy)2,5-dimethylhexane;

and thereafter vulcanizing the resulting composition.

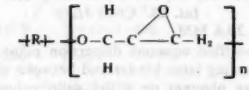
3,945,967

THERMALLY STABLE POLYCARBONATE COMPOSITION

Donald B. G. Jaquiss, New Harmony, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 7, 1974, Ser. No. 512,434
Int. Cl.[2] C08J 3/20
U.S. Cl. 260—45.8 A 4 Claims

1. A thermally stable polycarbonate composition comprising in admixture, an aromatic carbonate polymer and a stabilizing amount of an additive which is a combination of an epoxy compound prepared from an epichlorohydrin and represented by the following formula:



wherein R is selected from the group consisting of alkyl radicals of 1 to 24 carbon atoms, aryl radicals containing 1 to 3 aromatic rings and n is an integer of from 1 to about 10, and the reaction product of the chlorine containing contaminant in said epoxy compound and an alkyl phosphite represented by the following formula:

wherein R_1 is an alkyl radical of from 1 to about 10 carbon atoms; the reactants being employed in such proportions as to form the volatile alkyl chloride derivative from said contaminant and the alkyl radical of the phosphite.

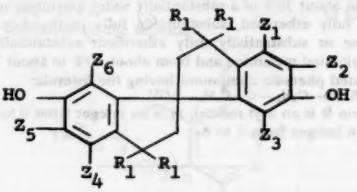
3,945,968

HEAT-RESISTANT POLYURETHANE COMPOSITIONS

Jean Goletto, Villeurbanne (Rhone), France, assignor to Rhone-Poulenc Textile, Paris, France

Filed Sept. 12, 1974, Ser. No. 505,604
Claims priority, application France, Sept. 17, 1973, 73.33243; July 5, 1974, 74.23441
Int. Cl.[2] C08J 3/20
U.S. Cl. 260—45.95 R 11 Claims

1. A polyurethane composition which comprises, as stabiliser, a hydroxylic spiro-bis-indane compound of the formula:



in which each of the R_1 radicals which may be identical or different; represents a methyl or ethyl radical, and each of Z_1, Z_2, Z_3, Z_4, Z_5 and Z_6, which may be identical or different; represents a hydrogen atom, a hydroxyl group, an alkyl radical, an alkoxy radical or a halogen atom, said compound possessing at least two hydroxyl groups on each benzene ring.

3,945,969

CONTINUOUS PRODUCTION OF POLYCARBONATES

Peter Horn, Ludwigshafen, and Heribert Kuerten, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 1, 1974, Ser. No. 438,753
Claims priority, application Germany, Feb. 2, 1973, 2305144
Int. Cl.[2] C08G 63/62
U.S. Cl. 260—47 XA 18 Claims

1. A process for the continuous production of a high molecular weight polycarbonate by reaction of an organic dihydroxy compound selected from the group consisting of hydroquinone, resorcinol, pyrocatechol, 1,2-dihydroxynaphthalene, 1,4-dihydroxynaphthalene, 1,5-dihydroxynaphthalene, 4,4′-dihydroxydiphenyl, 2,2′-dihydroxydiphenyl, 4,4′-dihydroxydiphenyl sulfide, 4,4′-dihydroxydiphenyl sulfoxide, 2,2′-dihydroxydiphenylsulfone, 4,4′-dihydroxydiphenyl-sulfone, 4,4′-dihydroxydiphenyl ether, 4,4′-dihydroxybenzophenone, 1,1-(4,4′-dihydroxydiphenyl)-1-phenylethane, 1,1-(4,4′-dihydroxydiphenyl)-cyclohexane, 4,4′-dihydroxydiphenylmethane and 2,2-(4,4′-dihydroxydiphenyl)-propane with phosgene in the presence of an amine or a salt of the same wherein the reaction is carried out in a plurality of reaction zones, a mixture of an aqueous-alkaline solution (a) of the organic compound and an aqueous solution of the amine or amine salt being introduced at the rate of from 1 to 50 meters per second and the phosgene (b) at the rate of from 30 to 300 meters per second in a first mixing and reaction zone, and condensed in said first mixing and reaction zone in a mainly aqueous alkaline solution to polycarbonate oligomers or polycarbonate, an organic solvent being introduced into said first mixing and reaction zone and incorporated into the mainly aqueous solution containing polycarbonate oligomers and polycarbonate at a point located in half removed from the inlet orifice for the aqueous-alkaline solution (a) and phosgene (b) or adjacent to the point of transition into the second reaction zone in such a way that back-mixing of the organic solvent containing polycarbonate oligomers or polycarbonate with the aqueous solution does not take place or only takes place to a trivial extent, and the condensation of the aqueous organic reaction

mixture being carried to completion in a second reaction zone by the two-phase interfacial method.

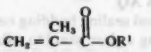
3,945,970

PREPARATION OF METHACRYLAMIDES

Roger W. Spoerke, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

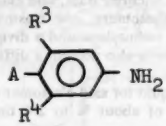
Filed June 28, 1974, Ser. No. 484,051
Int. Cl.² C08F 2/16, 20/58, 20/60
U.S. Cl. 260—47 UA **12 Claims**

1. A process for the production of a polymer containing a bound methacrylamide antioxidant comprising (a) reacting a methacrylic ester with an amine in an organic solvent having a boiling point above 100° C. in the presence of a basic metallic catalyst to yield an intermediate metallic salt, (b) removing the salt from solution, (c) washing the salt with an organic solvent, (d) at least partially drying the salt, and (e) adding the salt as a comonomer to an aqueous polymerization system wherein an in situ hydrolysis occurs during the polymerization reaction and wherein the methacrylic ester has the general structure (I)



(I),

the amine has the general structure (II)



(II)

and the basic metallic catalyst is selected from the group consisting of alkoxy metal halide bases having the formula R^5OZX, alkali metals, alkaline earth metals and amides, hydrides, hydroxides and alkoxides of alkali metals and alkaline earth metals, and wherein R^1 is a radical selected from the group consisting of alkyl radicals having from 1 to 10 carbon atoms, aryl radicals having from 6 to 12 carbon atoms, cycloalkyl radicals having from 5 to 12 carbon atoms, A is selected from the group consisting of HO— and R^2 NH wherein R^2 is selected from the group consisting of hydrogen, alkyl radicals having from 1 to 20 carbon atoms, cycloalkyl radicals having from 5 to 12 carbon atoms, aryl radicals having from 6 to 12 carbon atoms, aralkyl radicals having from 7 to 13 carbon atoms and wherein R^3 and R^4 are the same or different radicals selected from the group consisting of hydrogen and tert. alkyl radicals having from 4 to 8 carbon atoms and wherein R^5 is an alkyl radical, Z is an alkaline earth metal selected from the group consisting of magnesium and calcium, and X is a halide selected from the group consisting of chlorine and bromine.

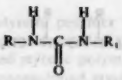
3,945,971

PHENYL UREA EPOXY RESIN ACCELERATOR

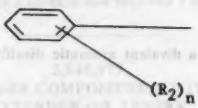
Tony Harrison, Maidenhead, and Roger G. Weatherhead, Stoneleigh, Epsom, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 20, 1974, Ser. No. 534,952
Claims priority, application United Kingdom, Jan. 3, 1974, 279/74
Int. Cl.² C08G 59/14
U.S. Cl. 260—47 EN **12 Claims**

1. In the process for preparing cured epoxy resins which comprises contacting an epoxy resin of the oxirane structure and having an oxirane epoxy equivalency greater than 1.0 with a polyamine curing agent having more than one non-tertiary amino group per molecule, the improvement which comprises conducting said contacting in the presence of from about 0.005 to about 0.1 moles per 100 parts of the epoxy resin of an accelerator of the general formula:



wherein
R is



R_2 is selected from the group consisting of an alkyl group containing from 1 to 4 carbon atoms, chlorine and bromine,
n is 0, 1 or 2, and
R_1 is selected from the group consisting of R and H.

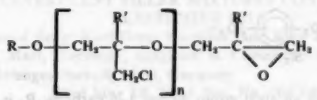
3,945,972

CURABLE EPOXY RESIN COMPOSITION COMPRISING AN EPOXY RESIN AND A REACTIVE DILUENT

Kazuhiko Sakamoto, Suita, Japan, assignor to Nitto Kasei Co. Ltd. and Osaka Soda Co. Ltd., both of Osaka, Japan

Filed Oct. 7, 1974, Ser. No. 512,977
Claims priority, application Japan, Oct. 9, 1973, 48-113471; Oct. 15, 1973, 48-115427; Oct. 26, 1973, 48-120916
Int. Cl.² C08G 59/04
U.S. Cl. 260—47 EP **5 Claims**

1. A curable epoxy resin composition comprising an epoxy resin having at least two epoxy groups selected from glycidyl and methylglycidyl in the molecule and a reactive diluent, at least 60% by weight of the total amount of said reactive diluent consisting of a compound expressed by the following formula (I)



(I)

wherein R is a member selected from the group consisting of straight-chain alkyl containing 1 to 7 carbon atoms, branched-chain alkyl containing 1 to 7 carbon atoms, alkenyl containing 2 to 7 carbon atoms, cycloalkyl containing 5 to 6 carbon atoms, methyl-substituted cycloalkyl containing 6 to 7 carbon atoms, phenyl cresyl and benzyl R′ is a hydrogen atom or methyl, a plurality of R′ groups may be the same or different, and n is a positive integer of 1 to 9.

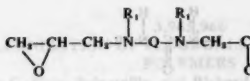
3,945,973

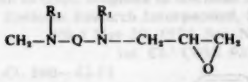
N,N′-DIGLYCIDYL-N,N′-DIALKYL ARYL DISULFONAMIDES

Harry A. Smith, and Edward G. Bozzi, Jr., both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

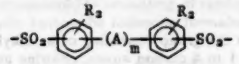
Filed May 3, 1974, Ser. No. 466,595
Int. Cl.² C08G 75/30
U.S. Cl. 260—49 **3 Claims**

1. A polyepoxide represented by the formulae:

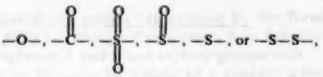




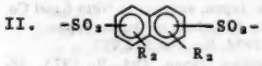
wherein Q is a divalent aromatic disulfonyl group selected from

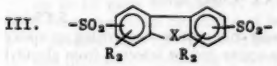
I. 

where A is a divalent hydrocarbon group having from 1 to 6 carbon atoms,

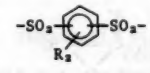


m is 0 or 1

II. 

III. 

where X is oxygen or sulfur and

IV. 

wherein R_1 is an alkyl group having 1–6 carbons; R_2 is independently hydrogen, an aliphatic hydrocarbon group having 1–6 carbons, chlorine, bromine or $-OR_3$ where R_3 is an acyl group having 1–6 carbons; *n* is a whole number in the range 0–5.

3,945,974

SMOKE SUPPRESSANTS FOR HALOGEN-CONTAINING PLASTIC COMPOSITIONS

Joseph Schwarcz, Highland Park; Bernard Engelbart, Trenton, and Edward L. White, Freehold, all of N.J., assignors to N L Industries, Inc., New York, N.Y.

Filed Dec. 20, 1973, Ser. No. 426,492

Int. Cl.² C08J *3/20*

U.S. Cl. 260—31.8 R **16 Claims**

1. Method for forming a smoke suppressing combustible polyvinyl chloride composition comprising a polyvinyl chloride resin, a stabilizer, and zinc oxide comprising the steps of adding zinc oxide to the components of said polyvinyl chloride composition during formulation thereof, said zinc oxide added in amounts in the range of from about 0.2 to no more than about 1.0 part per 100 parts polymer resin.

15. Method for forming a smoke suppressing combustible acrylonitrile-butadiene-styrene polymer containing an organic halide flame retardant comprising: adding zinc oxide to the components of said polymer during formulation thereof said zinc oxide added in amounts in the range of from about 0.2 to no more than about 1.0 part per 100 parts polymer resin.

16. Method for forming a smoke suppressing combustible polyester containing an organic halide flame retardant comprising: adding zinc oxide to the components of said polyester during formulation thereof said zinc oxide added in amounts in the range of from about 0.2 to no more than about 1.0 part per 100 parts resin.

3,945,975

SEALING ADHESIVE STRANDS AND COMPOSITIONS THEREFOR

Donald Robert Strack, Dayton, Ohio, assignor to Protective Treatments, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 551,878, May 23, 1966, abandoned, and a continuation-in-part of Ser. No. 611,129, Jan. 23, 1967, Pat. No. 3,478,475, and a continuation-in-part of Ser. No. 607,022, Jan. 3, 1967, Pat. No. 3,500,603, and a continuation-in-part of Ser. No. 738,548, June 20, 1968, abandoned. This application Dec. 23, 1970, Ser. No. 101,084

Int. Cl.² C08K *5/01, 5/03, 5/12*

U.S. Cl. 260—33.6 AQ **8 Claims**

1. An adhesive and sealing bedding composition adapted for adhesively attaching a glass panel to a flange about an opening in an automotive vehicle, said composition comprising an intimate mixture of:

a. an elastomer in uncured state, said elastomer comprising a mixture of elastomers, one elastomer comprising a copolymer of a isobutylene and a divinyl aromatic compound, and there is also present a different polybutylene based elastomer;

b. a plasticizing liquid for said elastomer of low volatility in the proportion of about ¾ to 2½ times the weight of elastomer, and

c. finely divided solids in the ratio of about 0.93 to about 2.5 times the weight of elastomer, of which solids from 0.3 to 2.5 times the weight of elastomer comprises solids which limit cold flow in service in said automotive vehicle to the required extent selected from the groups:

1. fibrous solids or

2. solids which form thixotropic mixtures with the plasticizing liquid,

said plasticizing liquid acting to permanently soften the composition so as to reduce spring back or rebound and allow permanent deformation under reduced load, said composition being extrudable into strand form and in said form being non-curing, soft and form retaining, and when measured as a rectangular strand about 0.4 inch on a side, having the properties of tensile yield strength above about 6 pounds per square inch, and being compressible to half thickness by a maximum force in the range about 25 to 46 pounds per square inch, having rebound after compression in the range of 2½ to 12½% of original thickness, flow in said service as measured by flow at 24 hours at 190°F. about zero to 0.02 inch and in destructive tension test between metal and glass surfaces failing entirely in coherence.

3,945,976

PROCESS FOR PRODUCING IMPACT RESISTANT POLYMER

John L. McCurdy, South Laguna, Calif., and Norman Stein, Flossmoor, Ill., assignors to Standard Oil Company, Chicago, Ill.

Division of Ser. No. 165,335, July 22, 1971, abandoned, which is a division of Ser. No. 763,537, Sept. 30, 1968, abandoned. This application Nov. 30, 1973, Ser. No. 420,454

Int. Cl.² B01J *8/00*; C08K *5/01*; C08L *9/06*

U.S. Cl. 260—33.6 AQ **6 Claims**

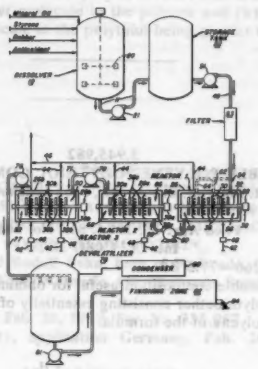
1. A continuous process for producing impact resistant styrene polymer comprising:

a. forming a solution consisting essentially of an effective amount of not more than 15 parts by weight of polybuta-

diene or styrene-butadiene rubber, from 0 to about 5 parts of internal lubricant and antioxidant, and at least 85 parts of styrene monomer;

b. pumping the solution into a first reactor comprising a horizontal cylindrical vessel surrounded by a cooling jacket and containing a plurality of internal cooling elements disposed in a general vertical plane transverse to the central horizontal axis of the reactor, a plurality of impeller blades interspaced between the cooling elements and mounted on and extending outward from a shaft positioned along the central horizontal axis of the reactor, and a means to rotate the shaft;

c. forming a first reacting mass in the first reactor by initiating polymerization in the solution;



d. establishing a first temperature zone within the first reactor of from 200° to 260°F. while slowly stirring the first reactor mass by the impeller blades such that a substantially homogeneous temperature is maintained throughout the reacting mass;

e. continuously passing the first reacting mass through the first reactor, in a general horizontal direction while maintaining plug flow, at a rate such that an effluent comprising a 10 to 35 weight percent of polymer solution is withdrawn continuously from the first reactor;

f. transferring the effluent from the first reactor into a second reactor of similar configuration to the first reactor to form a second reacting mass;

g. establishing a second temperature zone within the second reactor of from 240° to 285°F. while slowly stirring the second reacting mass by the impeller blades such that a substantially homogeneous temperature is maintained throughout the reacting mass;

h. continuously passing the second reacting mass through the second reactor, in a general horizontal direction while maintaining plug flow, at a rate such that an effluent comprising a 35 to 60 weight percent solution of polymer is withdrawn continuously from the second reactor;

i. transferring the effluent from the second reactor into a third reactor of similar configuration to the first and second reactors to form a third reacting mass;

j. establishing a third temperature zone within the third reactor of from 250° to 480°F. while slowly stirring the third reacting mass by the impeller blades such that a substantially homogeneous temperature is maintained throughout the reacting mass;

k. continuously passing the third reacting mass through the third reactor, in a general horizontal direction while maintaining plug flow, at a rate such that an effluent comprising more than 95 weight percent of polymer is withdrawn continuously from the third reactor; and

l. devolatilizing the styrene polymer withdrawn from the third reactor to remove unreacted styrene monomer,

whereby the devolatilized styrene polymer contains less than 0.5 weight percent of uncombined styrene monomer, has a heat distortion temperature greater than 155°F., an Izod impact strength (unannealed) greater than 0.9 ft-lb/in, a melt index between 1 and 10 grams/10 minutes, and an elongation greater than 25 percent, and contains styrene-rubber copolymer particles having a particle size between 1 and 10 microns.

3,945,977

HARD RUBBER COMPOSITIONS WITH HIGH EXTENDER OIL LEVELS

Kenneth E. Snavely, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 20, 1974, Ser. No. 453,182

Int. Cl.² C08K *5/01*

U.S. Cl. 260—33.6 AQ **8 Claims**

1. A vulcanizable composition characterized by a high extender oil level comprising:

a. a butadiene-styrene block copolymer having the configuration A–B wherein A is an essentially homopolymer block of styrene and B is selected from the group consisting of an essentially homopolymer block of butadiene and a random copolymer block of butadiene and styrene, wherein said block copolymer contains from 30 to 75 weight percent styrene, said block A comprises 30 to 50 weight percent of said block copolymer and the molecular weight of said block copolymer is in the approximate range of 50,000 to 700,000;

b. from 40 to 100 parts by weight of an extender oil selected from the group consisting of aromatic oils, aliphatic oils, naphthenic oils and mixtures thereof, per 100 parts by weight of said block copolymer; and

c. from 20 to 100 parts by weight of carbon black per 100 parts by weight of said block copolymer.

3,945,978

PROCESS FOR THE PRODUCTION OF POURABLE, PULVERULENT FILLER MIXTURES CONTAINING PLASTICIZER OILS

Gerhard Berg; Karl-Heinz Nordsiek, and Egge Barnstedt, all of Marl, Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Germany

Filed May 10, 1974, Ser. No. 468,669

Claims priority, application Germany, May 12, 1973, 2324009

Int. Cl.² C08K *5/01*; **C08J** *3/20*

U.S. Cl. 260—33.6 AQ **13 Claims**

1. In a process for the preparation of discrete, finely divided, tack-free, pourable, powdery filler-containing elastomer particles containing a plasticizing amount of a mineral oil plasticizer from an admixture of

a. an aqueous emulsion of a vulcanizable elastomer consisting essentially of (i) a solution of a vulcanizable elastomer dissolved in a volatile, inert organic solvent, (ii) an elastomer-emulsifying amount of a cationic amine surfactant, and (iii) water, and

b. an aqueous dispersion consisting essentially of a filler emulsifying amount of a cationic amine surfactant and 20–500% by weight, based on the weight of said elastomer, of a solid, finely divided elastomer filler, which process includes introducing said admixture into an aqueous alkali silicate precipitation bath and simultaneously evaporating said elastomer solvent to form said filler-containing elastomer particles, the improvement which comprises:

employing as the filler of said component (b) a free-flowing, pulverulent premix consisting essentially of 1–100 parts by weight, per 100 parts by weight of said filler, of a mineral oil plasticizer absorptively bound thereto.

3,945,979

POLYCARBONATE RESIN COMPOSITIONS WITH IMPROVED TRANSPARENCY

Haruo Kobayashi; Takenori Asajima, both of Chiba, and Yoshihiro Narita, Tokuyama, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Dec. 5, 1974, Ser. No. 529,929

Claims priority, application Japan, Dec. 24, 1973, 48-143648

Int. Cl.² C08L 69/00

U.S. Cl. 260—37 PC 4 Claims

1. Polycarbonate resin composition which comprises a polycarbonate resin and a colorant mixture in an amount sufficient to improve the transparency of said polycarbonate resin, said colorant mixture comprising 1,8-bis-p-methylphenylamino anthraquinone and 2,3-bis-N-methyl-N-p-methylphenylamino-6,7-dimethyl anthraquinone or 2,3-bis-N-methyl-N-propylphenylamino-6,7-dimethyl anthraquinon, wherein the weight ratio of 1,8-bis-p-methylphenylamino anthraquinone to 2,3-bis-N-methyl-N-p-methylphenylamino-6,7-dimethyl anthraquinone or 2,3-bis-N-methyl-N-propylphenylamino-6,7-dimethyl anthraquinone is from about 1.5:1 to about 1:1.

3,945,980

PROCESS FOR PRODUCING FINELY DIVIDED HARDENED RESINS

Tsuneo Tsubakimoto, and Iwao Fuzikawa, both of Toyonaka, Japan, assignors to Nippon Shokubai Kazaku Kogyo Co. Ltd., Osaka, Japan

Filed Oct. 2, 1973, Ser. No. 402,759

Claims priority, application Japan, Oct. 4, 1972, 47-98956

Int. Cl. C08g 51/04

U.S. Cl. 260—39 P 9 Claims

1. A process for preparing a suspension of a finely divided hardened resin which comprises, in combination, the steps of reacting in an aqueous medium at pH of 5 – 10 a member selected from the group consisting of benzoguanamine and a mixture of 100 – 50 % by weight of benzoguanamine and 0 – 50 % by weight of melamine with formaldehyde in a ratio of 1 mole of the former to 1.2 – 3.5 moles of the latter to prepare an aqueous liquid of a soluble and fusible resin having a degree of modified water tolerance of 0 – 150 %, introducing said aqueous liquid to an aqueous solution of protective colloid with stirring to prepare an emulsion of a soluble and fusible resin, adding a curing catalyst to said emulsion, followed by holding same for at least 1 hour at a temperature in the range of 40° – 60°C., and thereafter heating the emulsion at a temperature in the range of 60° – 200°C. under normal atmospheric or superatmospheric pressure to effect the hardening of the resin.

3,945,981

LIGHT STABLE POLYURETHANE ELASTOMER PREPARED FROM ALIPHATIC ISOCYANATE USING THIO TIN ORGANIC COMPOUND CONTAINING SULFUR ATTACHED TO TIN AS HEAT ACTIVATED CATALYST

John R. Robertson, Newtown, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Nov. 8, 1974, Ser. No. 522,183

Int. Cl.² C08G 18/24; B05D 7/26

U.S. Cl. 260—75 NB 37 Claims

1. A curable solvent-free liquid polyurethane composition having a pot life of at least 25 minutes at room temperature consisting essentially of a mixture of a polyol and a monomeric hydrocarbon-containing aliphatic polyisocyanate containing, as a heat-activatable catalyst, a thio tin organic compound having sulfur directly attached to the tin, in an amount effective to catalyze the cure of the composition, the said catalyst having the formula

$$(R-)_a Sn\ [-S(R^1)x]_b$$

wherein:

R is an alkyl radical having 3 to 10 carbon atoms:

R^1 is an alkyl radical having 4 to 20 carbon atoms or a radical of the formula $-R^2COOR^3$ where R^2 is $(CH_2)n$, n being from 1 to 5, and R^3 is an alkyl radical having 4 to 18 carbon atoms;

x is zero or 1, a is 2 or 3, and b is 1 or 2; the equivalence ratio or isocyanate groups to hydroxyl groups in said composition being from 0.90:1 to 1.1:1, and the said composition being capable of curing in from 30 seconds to 3 minutes at corresponding temperatures of from 375° to 300°F to form a solid, chain extended lightstable polyurethane elastomer.

3,945,982

CURABLE POLYENE-POLYTHIOL COMPOSITIONS

Charles R. Morgan, Brookeville, Md., assignor to W. R. Grace & Co., New York, N.Y.

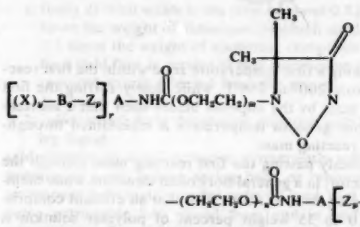
Filed Apr. 15, 1974, Ser. No. 461,207

Int. Cl.² C08G 18/00

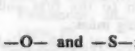
U.S. Cl. 260—77.5 BB 5 Claims

1. A curable composition useful for obtaining a solid cross-linked polythioether consisting essentially of:

1. A polyene of the formula:

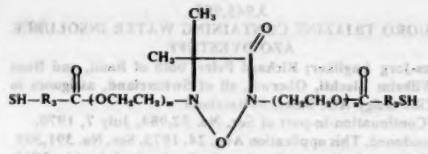


wherein A and B are polyvalent organic radical members free of reactive carbon to carbon unsaturation and are independently selected from the group consisting of aryl, substituted aryl, aralkyl, substituted aralkyl, cycloalkyl, substituted cycloalkyl, alkyl and substituted alkyl containing 1 to 36 carbon atoms and mixtures thereof, said group members can be connected by a chemically compatible linkage selected from the group consisting of —O—, —S—, carboxylate, carbonate, carbonyl, urethane and substituted urethane, urea and substituted urea, amide and substituted amide, amine and substituted amine and hydrocarbon; Z is a divalent chemically compatible linkage selected from the group consisting of



—O— and —S—; X is a member selected from the group consisting of (a) $-(CH_2)_d-CR'=CHR$, (b) $-O-(CH_2)_d-CR'=CHR$, (c) $-S-(CH_2)_d-CR'=CHR$, (d) $-(CH_2)_d-C\equiv CR$, (e) $-O-(CH_2)_d-C\equiv CR$, (f) $-S-(CH_2)_d-C\equiv CR$; and mixtures thereof; where R and R' each are independently selected from the group consisting of hydrogen and methyl radicals; d, p and q are each integers from 0 to 1; m and n are each integers of at least 1; with m + n from 2 to 22 and r at least 1, and y from 1 to 10; and

(2.) A polythiol of the formula:



wherein m and n are each at least 1 and $m + n$ is 2 and 22 and R_3 is a polyvalent organic radical member free of reactive carbon-to-carbon unsaturation and is selected from the group consisting of aryl, substituted aryl, aralkyl, substituted aralkyl, cylcoalkyl, substituted cylcoalkyl, alkyl and substituted alkyl groups containing 1 to 16 carbon atoms and mixtures thereof, the total combined functionality of (a) the reactive carbon-to-carbon bonds per molecule in the polyene and (b) the thiol groups per molecule in the polythiol being greater than 4.

3,945,983

WATER SOLUBLE COPOLYAMIDE FROM (1) POLYALKYLENE POLYAMINE, (2) DICARBOXYLIC ACID, (3) DIAMINE OR LACTAM OR AMINO ACID AND (4) EPICHLOROHYDRIN

Lutz Hoppe, and Rudolf Behn, both of Walsrode, Germany, assignors to Wolff Walsrode AG, Walsrode-Bomlitz, Germany

Filed Feb. 26, 1973, Ser. No. 335,957

Claims priority, application Germany, Feb. 26, 1972, 2209242

Int. Cl.² C08G *69/48*

U.S. Cl. 260—78 L **6 Claims**

1. Water-soluble resinous copolyamide with improved storage stability and good ability to anchor polyvinylidene halide copolymers to cellulose-containing substances, consisting essentially of resinous condensation product of 35–45% by weight of polyalkylene polyamine, 45–60% by weight of dicarboxylic acid selected from the group consisting of adipic acid, azelaic acid, sebacic acid and terephthalic acid; and 5–20% by weight of at least one member of the group consisting of saturated aliphatic diamine, ε-caprolactam and amino caproic acid; wherein 1 mol equivalent of each of the secondary amino groups of said copolyamide is reacted with from 0.1–0.4 mol of epichlorohydrin for crosslinking; wherein the percent by weight of reactants is based on the total weight of reactants before reaction with epichlorohydrin.

3,945,984

PREPARING POLYAMIDES BY ANIONIC POLYMERIZATION OF LACTAMS

Zbynek Bukac, and Jan Sebenda, both of Prague, Czechoslovakia, assignors to Cceskoslovenska akademie ved, Prague, Czechoslovakia

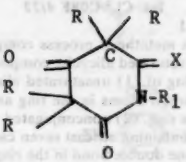
Division of Ser. No. 275,155, July 26, 1972, Pat. No. 3,843,608. This application Mar. 26, 1974, Ser. No. 454,906

Claims priority, application Czechoslovakia, July 27, 1971, 5478-71; July 27, 1971, 5481-71

Int. Cl.² C08G *69/24, 69/20*

U.S. Cl. 260—78 L **5 Claims**

1. The method of preparing solid polyamides by anionic polymerization of cyclic lactams containing at least 4 atoms in a ring which comprises polymerizing at least one such lactam in the presence of a cocatalyst having the formula



wherein R is C_{1-18} alkyl, C_{1-18} alkenyl, or arloweralkyl, R_1 is R, alryl or diloweralkylaminoaryl, lower alkoxyaryl and X is oxygen or sulfur.

3,945,985

METHOD FOR PREPARING VINYL HALIDE POLYMERS HAVING IMPROVED PROCESSING CHARACTERISTICS AND POLYMERS PREPARED THEREBY

Leonard Feiler, Riverdale, N.Y., and Sheldon F. Gelman, Danbury, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

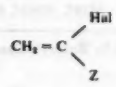
Continuation of Ser. No. 756,309, Aug. 8, 1968, abandoned. This application Aug. 23, 1971, Ser. No. 174,250

Int. Cl.² C08F *3/30, 3/20, 15/06, 15/32*

U.S. Cl. 260—92.8 W **5 Claims**

1. A method for preparing vinyl halide polymers exhibiting improved processing characteristics without sacrificing physical properties comprising:

a. iniating the free radical suspension polymerization of a ethylenically unsaturated monomer composition containing at least 75%, by weight, of a vinyl halide of the formula:



wherein Z is hydrogen or halogen and Hal is halogen at a first reaction temperature; said polymerization being conducted in the presence of a first azo compound as a free radical initiator and of a polymer modifier comprising a polymercaptan chain transfer agent; and, after partial polymerization is accomplished;

b. changing the reaction temperature to at least one subsequent reaction temperature different from the immediately preceding reaction temperature, adding a second azo compound as a free radical initiator, and continuing said polymerization at said subsequent temperature, said subsequent temperature being conducive to forming a polymer of an average molecular weight different from the average molecular weight obtained during polymerization at said immediately preceding reaction temperature;

one of said azo compounds having a shorter half-life than the other at 80°C.

3,945,986

METATHESIS OF CYCLOOLEFINS

Eilert A. Ofstead, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 1, 1974, Ser. No. 456,913
Int. Cl.[2] C08F 4/22
U.S. Cl. 260—93.1 8 Claims

1. A cycloolefin metathesis process comprising polymerizing at least one unsaturated alicyclic compound selected from the group consisting of (1) unsaturated alicyclic compounds containing five carbon atoms in the ring and containing one double bond in the ring, (2) nonconjugated unsaturated alicyclic compounds containing at least seven carbon atoms in the ring and at least one double bond in the ring, and (3) polycyclic olefins and diolefins, by subjecting said alicyclic compounds or mixtures thereof to polymerization conditions in the presence of a catalyst system comprising (A) at least one transition metal salt selected from the group consisting of tungsten halides and tungsten oxyhalides, (B) at least one compound selected from the group consisting of alkylaluminum sesquihalides and alkylaluminum dihalides, and (C) at least one hydroxy compound of the general formula ROH wherein R is selected from the group consisting of alkyl and cycloalkyl and wherein R contains a nitrile substituent, wherein the molar ratio of A:B:C lies within the range of 1:0.5–10:0.5–3.

3,945,987

CARBAMIDE ADDUCTS OF POLYMETALOPHOSPHAMATE

Ernest Stossel, 203 W. 81st St., New York, N.Y. 10024

Filed May 30, 1974, Ser. No. 474,821
Int. Cl.[2] C07B 21/00
U.S. Cl. 260—96.5 C 16 Claims

1. An alkali stable water soluble adduct of an aluminum amido polyphosphate complex having the formula $[NH_4H Al(PO_3NH_2.H_2O)_4]_y$ with urea.

5. A method of preparing the adduct of claim 1 which comprises adding urea to a solution of an aluminum amidophosphate complex, wherein said urea is used in an amount of at least 2 moles for every 3 moles of phosphoric acid present in said phosphate.

3,945,988

PROCESS FOR ISOLATION OF INSULIN FROM PLANT SOURCE

Pushpa Khann; Tej Narain Nag; Satish Chandrajain, and Suchendra Mohan, all of 74, C, Sarojini Marg C'Scheme, Jaipur, India

Filed July 16, 1974, Ser. No. 488,974
Int. Cl.[2] A61K 37/26; C12B 1/20
U.S. Cl. 260—112.7 6 Claims

1. A process for isolating insulin from *Memordica charantia* Linn comprising extracting an organic material selected from the group consisting of cultures raised from seeds of *Memordica charantia* Linn and the fruit of *Memordica charantia* Linn with a mixture of ethanol, water and sulfuric acid, separating the extract from remaining material, adjusting the pH of said extract to 1.5 to 2.0 with ammonia or hydrochloric acid, adding cold ethanol and diethyl ether to precipitate insulin therefrom, adding zinc traces to the precipitate to crystallize the insulin as white crude crystals, and finally purifying the white crude crystals to white needle-like crystals.

3,945,989

FLUORO TRIAZINE CONTAINING WATER INSOLUBLE AZO DYESTUFF

Hans-Jorg Angliker; Richard Peter, both of Basel, and Hans Wilhelm Liechti, Oberwil, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 52,984, July 7, 1970, abandoned. This application Aug. 24, 1973, Ser. No. 391,399
Claims priority, application Switzerland, July 11, 1969, 10662/69
Int. Cl.[2] C09B 29/36, 43/12
U.S. Cl. 260—153 4 Claims

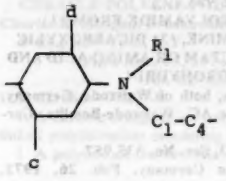
1. A monoazo dyestuff of the formula

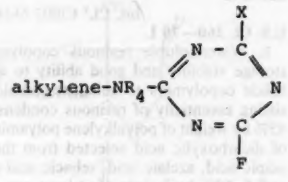
D — N = N — B

wherein

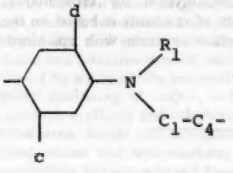
D is thiazole, benzothiazole, pyridine, triazole, pyrazole, imidazole, thiadiazole, isothiazole or benzisothiazole, which is unsubstituted or substituted by a member selected from the group consisting of nitro cyano, methyl, methylsulphonyl, bromine, acetylamino, phenyl, chlorine, methoxy, ethoxy, thiocyano, and carbethoxy, and

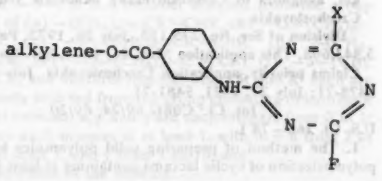
B is a member selected from the group consisting of



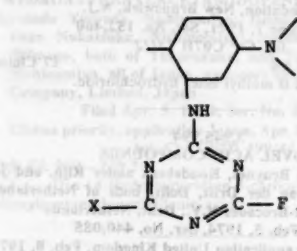


and





and



wherein

c and d each are hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, phenylthio or phenoxy, and

c in addition is chlorine, bromine, trifluoromethyl, $-CONH_2$, C_1–C_4-alkylcarbonylamino, benzoylamino, pyridine carbonylamino, thiophencarbonylamino, chloroacetylamino, methylsulfonylamino, ethylsulfonylamino, p-toluenesulfonylamino, C_1–C_4-alkoxy-carbonylamino or phenoxycarbonylamino,

R_1 is unsubstituted C_1–C_4-alkyl or C_1–C_4-alkyl substituted by halogen, hydroxy, phenyl, cyanoethoxy, C_1–C_4-alkoxy, C_1–C_3-alkoxy-carbonyl, formylamino, C_1–C_4-alkylcarbonyloxy, C_1–C_4-alkylcarbamoyloxy, phenylcarbamoyloxy, C_1–C_3-alkyloxycarbonyloxy or benzoyloxy;

R_4 is hydrogen or C_1–C_4 alkyl and

X is chlorine or fluorine.

3,945,990

DISAZO COMPOUNDS CONTAINING AN ALKANOLAMINE SUBSTITUTED TRIAZINE COMPONENT

Takuo Ikeda, Ibaraki; Takushige Hadano, Nishinomiya, and Syunsuke Nogi, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

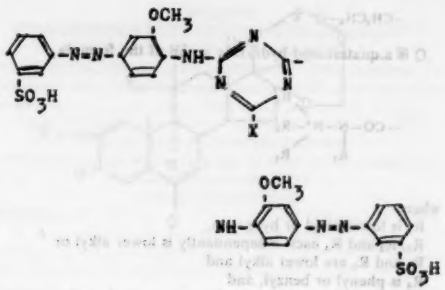
Filed Oct. 5, 1973, Ser. No. 403,975

Claims priority, application Japan, Oct. 16, 1972, 47-103778

Int. Cl.² C09B *43/16*

U.S. Cl. 260—153 **2 Claims**

1. A compound of the formula, as a free acid,



wherein X is selected from the group consisting of monoethanolamine, diethanolamine, monopropanolamine and dipropanolamine.

3,945,991

HETEROCYCLIC AZO COMPOUNDS CONTAINING A QUATERNATED HYDRAZIDE GROUP

Visvanathan Ramanathan, Basel, and Hans Wilhelm Liechti, Oberwil, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

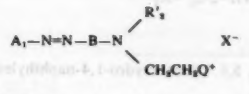
Division of Ser. No. 225,274, Feb. 10, 1972, Pat. No. 3,843,622, which is a continuation-in-part of Ser. No. 17,317, March 6, 1970, abandoned, which is a continuation-in-part of Ser. No. 648,204, June 23, 1967, abandoned. This application Aug. 5, 1974, Ser. No. 494,803

Claims priority, application Switzerland, June 24, 1966, 9189/66

Int. Cl.² C09B *29/08, 29/26, 29/38, 43/00*

U.S. Cl. 260—162 **3 Claims**

1. A water-soluble basic dyestuff of the formula



in which

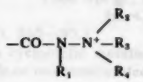
A_1 is thiazole, benzthiazole, pyrazole, indazole, triazole, thiadiazole, pyridine or quinoline; and is unsubstituted or substituted by lower alkyl, trifluoromethyl, lower alkoxy, chloro, bromo, cyano, nitro, phenylazo, loweralkoxycarbonyl, lower alkylcarbonyl, lower alkylsulfonyl, acylamino, sulfonic acid amide, phenyl, methoxyphenyl, chlorophenyl or nitrophenyl,

B is para-phenylene or para-phenylene substituted by chlorine, bromine, lower alkyl, trifluoromethyl, lower alkoxy, acylamino or amino,

R'_2 is lower alkyl, cyanoloweralkyl, loweralkoxy-loweralkyl, lower alkanoyloxy-lower alkyl, lower alkylsulphonyloxy-lower alkyl, arylcarbonyloxy-lower alkyl, arylsulphonyloxy-lower alkyl, arylloweralkyl or a residue of the formula

$-CH_2CH_2-Q^+ X^-$,

Q is a quaternated hydrazide group of the formula



where

R_1 is lower alkyl or hydrogen,

R_2, R_3 and R_4 each independently is lower alkyl or

R_2 and R_3 are lower alkyl and

R_4 is phenyl or benzyl, and

X is an anion

and where

"acylamino" means lower alkanoylamino, aryl carbonylamino, lower alkyl sulfonylamino, arylsulfonylamino, lower alkoxy-carbonylamino, ureido and lower alkylureido;

"sulfonamide" means an unsubstituted sulfonic acid amide group or a sulfonic acid amide group substituted by lower alkyl, aryl-loweralkyl or aryl, and

"aryl" means unsubstituted phenyl or phenyl substituted by lower alkyl, lower alkoxy, chlorine or bromine and

"lower" means containing up to 4 carbon atoms.

3,945,992

ARYLSULPHONYLAMINOSULPHONYLPHENYL-AZO-ARYLENE-AZO-PHENYL DYESTUFF

Richard Sommer, Leverkusen, and Gerhard Wolfrum, Bergisch-Neukirchen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

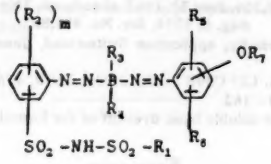
Filed Feb. 22, 1974, Ser. No. 445,296

Claims priority, application Germany, Feb. 22, 1973, 2308723

Int. Cl.² C09B *43/18, 31/06;* D06P *3/24*

U.S. Cl. 260—174 **5 Claims**

1. Disazo dyestuff which in the form of the free acid corresponds to the formula



wherein

B is 1,4-phenylene, 5,6,7,8-tetrahydro-1,4-naphthylene or 1,4-naphthalene;

R_1 is phenyl, 1-naphthyl, 2-naphthyl, C_1–C_4-alkyl, di-C_1–C_4-alkylamino, or phenyl substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, cyano, or nitro;

R_2 is chlorine, bromine, C_1–C_4-alkoxy, C_1–C_4-alkyl, substituted C_1–C_4-alkoxy, or substituted C_1–C_4-alkyl wherein the substituent is halogen, cyano, hydroxyl or phenyl;

R_3 and R_4 are hydrogen, chlorine, bromine, C_1–C_4-alkyl, C_1–C_4-alkoxy, substituted C_1–C_4-alkyl, or substituted C_1–C_4-alkoxy wherein the substituent is halogen, cyano, hydroxyl or phenyl;

R_5 is hydrogen, chlorine, bromine, fluorine, phenyl, C_1–C_4-alkyl, or C_1–C_4-alkoxy;

R_6 is hydrogen, C_1–C_4-alkyl, or C_1–C_4-alkoxy;

R_7 is phenylsulphonyl, naphthylsulfonyl, tetrahydronaphthylsulfonyl or any of these three radicals further substituted on the carbocyclic nucleus by chlorine, bromine, methyl, ethyl, methoxy, or nitro; and

m is a number from 0 to 2.

3,945,993

DERIVATIVES OF POLYENE MACROLIDE ANTIBIOTICS

Carl P. Schaffner, Trenton, and Witold Mechlinski, New Brunswick, both of N.J., assignors to Rutgers Research and Educational Foundation, New Brunswick, N.J.

Filed June 7, 1971, Ser. No. 152,460

Int. Cl.² C07H *15/22*

U.S. Cl. 260—210 AB **17 Claims**

1. Amphotericin B methyl ester hydrochloride.

3,945,994

NOVEL ACID COMPOUNDS

Cornelis Adrianus Bruynes, Koudekerk ander Rijn, and Johannes Karel van der Drift, Delft, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

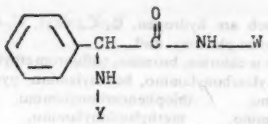
Filed Feb. 5, 1974, Ser. No. 440,085

Claims priority, application United Kingdom, Feb. 8, 1973, 6267/73

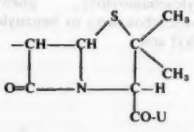
Int. Cl.² C07D *499/68*

U.S. Cl. 260—239.1 **8 Claims**

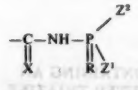
1. Penicillanic derivatives of the formula



wherein W is a group of the formula



wherein U is —OE, E is select-d from the group consisting of hydrogen, a non-toxic, pharmaceutically acceptable salt-forming cation and a conventional, non-toxic, pharmaceutically acceptable ester-forming group which is known to improve the absorption characteristics of penicillanic acid derivatives after oral administration to warm-blooded animals and Y is a group of the formula



wherein X and R are the same or different and each is selected from the group consisting of oxygen and sulphur, and Z^1 and Z^2 are the same or different and each is selected from the group consistng of (lower)-alkoxy, (lower)alkylthio, optionally substituted phenoxy, optionally substituted benzyloxy, optionally substituted amino, optionally substituted (lower) alkyl, optionally substituted phenyl, hydroxy and OM, said substitutents being selected from the group consisting of halogen, nitro, cyano, lower alkyl, and lower alkoxy M is a non-toxic, pharmaceutically acceptable salt-forming cation, or Z^1

and Z^2 together with the phosphorous atom form an optionally unsaturated, 5 to 7 membered phosphorous and carbon heterocycle ring optionally substituted with at most four lower alkyl groups.

3,945,995

D-α-(4-HYDROXYPYRIDINE-3-CARBONAMIDO)-P-HYDROXYPHENYLACETAMIDOPENICILLANIC ACID

Hirotada Yamada, Nishinomiya; Hisao Tobiki, Toyonaka; Iwao Nakatsuka, Nishinomiya; Norithiko Tanno; Kozo Shimago, both of Takarazuka, and Takenari Nakagome, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Apr. 5, 1974, Ser. No. 458,417

Claims priority, application Japan, Apr. 5, 1973, 48-39358

Int. Cl.² C07D *499/44*

U.S. Cl. 260—239.1 1 Claim

1. D-α-(4-Hydroxypyridine-3-carbonamido)-p-hydroxyphenylacetamidopenicillanic acid.

3,945,996

ADDUCTS OF EPOXY COMPOUNDS AND PRODUCTS OF REACTION OF ε-CAPROLACTAM WITH N-ALKYLALKYLENEDIAMINE AND METHODS OF PREPARATION

Jens Conrad, Hilden; Hans Werner Eckert, Dusseldorf; Ferdi Saygin, Erkrath, and Harald Schnegelberger, Leichlingen, all of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

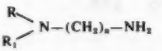
Filed Sept. 18, 1974, Ser. No. 507,045

Claims priority, application Germany, Sept. 24, 1973, 2347932

Int. Cl.² C07D *223/10*

U.S. Cl. 260—239.3 R 11 Claims

1. An addition product of an epoxy compound selected from the group consisting of ethylene oxide, propylene oxide and glycidol with a reaction product of ε-caprolactam with an N-alkylalkylenediamine of the formula



wherein R is selected from the group consisting of alkyl having 8 to 18 carbon atoms, hydroxyalkyl having 8 to 18 carbon atoms, alkenyl having 8 to 18 carbon atoms, hydroxyalkenyl having 8 to 18 carbon atoms, alkadienyl having 8 to 18 carbon atoms, alkatrienyl having 8 to 18 carbon atoms, and mixtures of alkyl derived from fatty acid mixtures having 8 to 18 carbon atoms, R_1 is a member selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms, and n is the integer 3, with the molar ratio of N-alkylalkylenediamine to ε-caprolactam ranging from 1:1 to 1:10, said reaction being carried out for 3 to 20 hours in the liquid phase at temperatures above 180°C to produce said reaction product, and then reacting said reaction product with said epoxy compound where the amount of epoxy compound is selected so that the molar ratio between the N-alkylalkylene diamine charged in said reaction product to said epoxy compound ranges from 1:0.5 to 3 at a temperature of between 50°C to 150°C for a time effective to produce said addition product.

3,945,997

STEROIDAL BICYCLIC DIOXANES

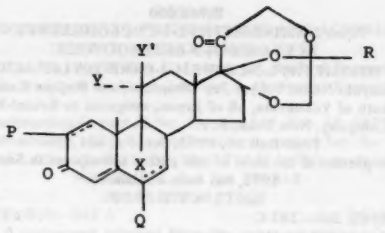
Christopher M. Cimarusti, Hamilton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 19, 1975, Ser. No. 578,597

Int. Cl.² C07J *71/00*

U.S. Cl. 260—239.55 R 13 Claims

1. A steroid having the formula



wherein P is hydrogen, methyl or chloro; Q is hydrogen, methyl or fluoro; X is hydrogen or halogen; Y is hydrogen and Y′ is hydroxyl, or together Y and Y′ are =0; and R is hydrogen, alkyl or aryl.

3,945,998

HERBICIDAL 4-BENZYLOXYMETHYL OXAZOLINES

Martin Anderson, Whitstable, and Peter H. Kirkham, Sittingbourne, both of England, assignors to Shell Oil Company, Houston, Tex.

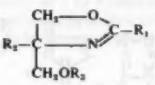
Filed July 3, 1972, Ser. No. 268,295

Claims priority, application United Kingdom, July 1, 1971, 30868/71

Int. Cl.² C07D *263/14*

U.S. Cl. 260—240 D 6 Claims

1. An oxazoline of the formula



wherein R_2 represents methyl or ethyl, R_3 represents benzyl, and R_1 represents phenyl, 4-nitrophenyl, benzyl, methyl, 4-methoxphenyl, 4-chlorophenyl, 3-pyridyl, 4-fluorophenyl, 2-furyl, decyl, 4-pyridyl, p-tolyl, styryl, 2-propenyl, o-tolyl, trifluoromethyl, 2-chlorobenzyl or 2-methoxyphenyl, and when R_1 represents phenyl R_3 then additionally represents 2-chlorobenzyl, 4-chlorobenzyl, 2,6-dichlorobenzyl, 4-methylbenzyl, 3-methylbenzyl or 4-nitrobenzyl.

3,945,999

PROCESS FOR PREPARING SOLID BIS-(4-FURFURYLIDENAMINO-PHENYL)-METHANE

Max Gruffaz, La Multiere, and Bernard Rollet, Lyon, both of France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed Apr. 24, 1974, Ser. No. 463,592

Claims priority, application France, Apr. 26, 1973, 73.15177

Int. Cl.² C07D *407/10*, *307/28*

U.S. Cl. 260—240 G 3 Claims

1. Process for the preparation of solid bis-(4-furfurylidenamino-phenyl)-methane, which comprises contacting furfural and bis-(4-amino-phenyl)-methane in a diethyl ether medium.

3,946,000

7-[α-(2-AMINOMETHYL-1-CYCLOHEXENYL)-ACETAMIDO]-3-HETEROCYCLIC THIOMETHYL-3-CEPHEM-4-CARBOXYLIC ACIDS

Takayuki Naito, Tokyo; Jun Okumura, and Hajime Kamachi, both of Yokohama, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

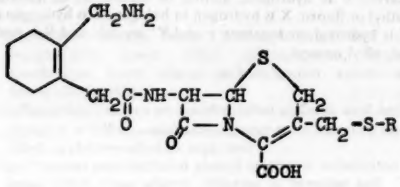
Filed Oct. 31, 1973, Ser. No. 411,559

The portion of the term of this patent subsequent to Sept. 23, 1992, has been disclaimed.

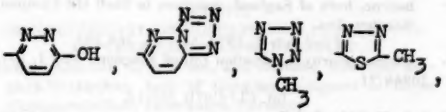
Int. Cl.² C07D 501/20

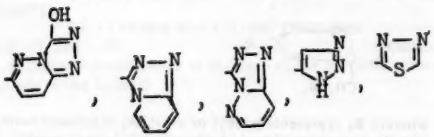
U.S. Cl. 260—243 C 51 Claims

1. An acid having the formula



wherein R is





or

or a nontoxic, pharmaceutically acceptable salt thereof.

3,946,001

(CARBAMOYLTHI OACETYL)CEPHALOSPORIN DERIVATIVES

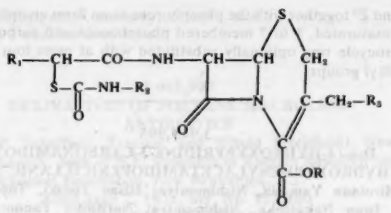
Uwe D. Treuner, and Hermann Breuer, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 17, 1974, Ser. No. 471,080

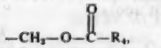
Int. Cl.² C07D 501/32

U.S. Cl. 260—243 C 12 Claims

1. A compound of the formula

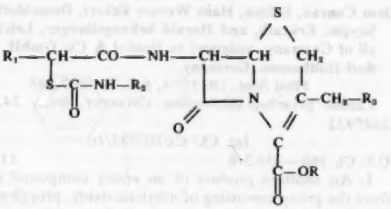


wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, diphenyl-lower alkyl, tri(lower alkyl)stannyl, tri(lower alkyl)silyl,

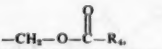


alkali metal, alkaline earth metal, tri-lower alkylamine salt or (lower alkyl)amine salt; R_1 is phenyl; R_2 is lower alkyl, lower alkoxymethyl, phenyl or phenyl-lower alkyl; R_3 is hydrogen, hydroxy or lower alkanoyloxy; and R_4 is lower alkyl, phenyl or phenyl-lower alkyl; said lower alkyl and lower alkanoyloxy groups having up to seven carbon atoms.

12. A compound of the formula



wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, diphenyl-lower alkyl, tri(lower alkyl)stannyl, tri(lower alkyl)silyl,



alkali metal, alkaline earth metal, tri(lower alkyl)amine salt or (lower alkyl)amine salt; R_1 is thienyl; R_2 is lower alkyl, lower alkoxymethyl, phenyl or phenyl-lower alkyl; R_3 is hydrogen, hydroxy or lower alkanoyloxy; and R_4 is lower alkyl, phenyl or phenyl-lower alkyl; said lower alkyl and lower alkanoyloxy groups having up to seven carbon atoms.

3,946,002

PROCESS FOR PREPARING CEPHALOSPORINS

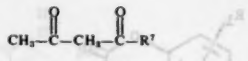
Michael Davison, St. Helens; David Binfield Frankham, Helsby, Near Warrington, and Thomas William Matches Spence, Warrington, all of England, assignors to Lilly Industries Limited, London, England

Filed July 11, 1974, Ser. No. 487,489

Int. Cl.² C07C 501/06

U.S. Cl. 260—243 C 5 Claims

1. In a process for preparing a 7-α-aminoacetamido cephalosporin in which (a) a 7-aminocephalosporin-4-carboxylic acid ester is reacted with an activated form of an α-aminoacetic acid, the amino group of which is protected by reaction with a β-dicarbonyl compound of the formula



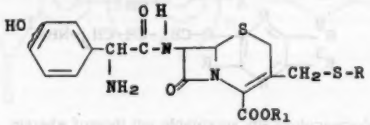
in which R^7 is C_1–C_4 alkyl or C_1–C_4 alkoxy, to form an enamine; and (b) the amino protecting group is removed from the resulting protected 7-α-aminoacetamido cephalosporin compound; the step which comprises adding to the reaction mixture from step (b) an amount of a hydrazine or a semicarbazide sufficient to prevent re-reaction of the β-dicarbonyl compound with the produced 7-α-aminoacetamido cephalosporin.

3,946,003
HYDROXY SUBSTITUTED PHENYLGLYCYLAMIDO-3-HETEROCYCLIC THIOMETHYL CEPHALOSPORINS

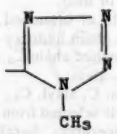
Robin D. G. Cooper, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 20, 1974, Ser. No. 498,886
Int. Cl.² C07D *501/32*
U.S. Cl. 260—243 C **3 Claims**

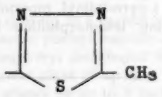
1. The cephalosporin compound of the formula



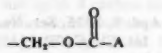
wherein R is the 1-methyl-1H-tetrazol-5-yl group of the formula



or the 5-methyl-1,3,4-thiadiazol-2-yl group of the formula



and R_1 is selected from the group consisting of 5-indanyl, phthalidyl, and an acyloxymethyl group of the formula



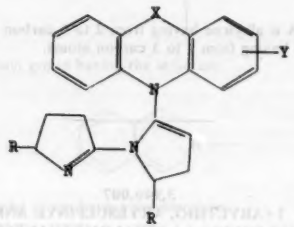
wherein A is C_1-C_4 alkyl or phenyl.

3,946,004
PHENOTHIAZINES, PHENOXAZINES AND ACRIDAN BIS-PYRROLINYL DERIVATIVES

Yao Hua Wu, and Walter G. Lobeck, Jr., both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Continuation-in-part of Ser. No. 336,845, Feb. 28, 1973, abandoned, which is a continuation-in-part of Ser. No. 147,667, May 27, 1971, Pat. No. 3,719,671. This application Nov. 6, 1974, Ser. No. 521,618
Int. Cl.² C07D *279/22*
U.S. Cl. 260—243 A **7 Claims**

1. A compound selected from the group consisting of 10-(bis-pyrrolinyl)phenothiazines[, 10-bis-pyrrolinyl)acridans and 10-(bis-pyrrolinyl)phenoxazines]represented by [Formula 1]



and non-toxic pharmaceutically acceptable acid addition salts thereof wherein

X is sulfur

Y represents hydrogen, trifluoromethyl, halogen, lower alkyl of from 1 to 4 carbon atoms inclusive or lower alkoxy of 1 to 4 carbon atoms inclusive; and

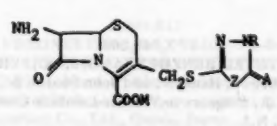
R represents hydrogen or straight chain lower alkyl of 1 to 4 carbon atoms inclusive.

3,946,005
7-AMINO-3-(1,2,4-TRIAZOLINYLTHIOMETHYL)CEPHALOSPORINS

David Alan Berges, Audubon, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 306,507, Nov. 14, 1972, Pat. No. 3,868,369. This application Dec. 3, 1974, Ser. No. 529,259
Int. Cl.² C07D *501/36*
U.S. Cl. 260—243 C **5 Claims**

1. A compound of the formula



wherein

Z is NR;

A is O or S;

R is hydrogen or C_1–C_4 alkyl; and

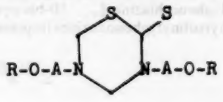
M is hydrogen, 2,2,2-trichloroethyl, benzhydryl, t-butyl, p-nitrophenyl, p-methoxyphenyl, p-methoxybenzyl, or benzyloxymethyl.

3,946,006
TETRAHYDROTHIADIAZINETHIONES

Heinz Eggensperger, Hamburg, and Karl-Heinz Diehl, Norderstedt, both of Germany, assignors to Sterling Drug Inc., New York, N.Y.

Filed Mar. 5, 1975, Ser. No. 555,440
Claims priority, application Germany, Mar. 6, 1974, 2410558
Int. Cl.² C07D 285/34
U.S. Cl. 260—243 R 8 Claims

1. 3,5-Bis(R—O—A)-tetrahydro-2H-1,3,5-thiadiazine-2-thione having the formula



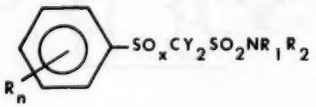
wherein A is alkylene having from 2 to 6 carbon atoms; and R is alkyl having from 1 to 3 carbon atoms.

3,946,007
1-(ARYLTHIO, ARYLSULFINYL AND ARYLSULFONYL)-1,1-DIHALOMETHANESULFONAMIDES

Christian T. Goralski, and Thomas C. Klingler, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 351,070, April 13, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,953
Int. Cl.² C07D 295/22
U.S. Cl. 260—247.1 R 11 Claims

1. A compound represented by the formula



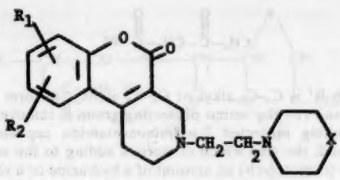
wherein R represents lower alkyl, lower alkoxy, fluoro, chloro or bromo, x represents an integer from 0 to 2, n represents an integer from 0 to 3, Y represents chloro or bromo and R_1 and R_2 independently represent hydrogen, lower alkyl, or, together with the nitrogen atom, form a morpholinyl, piperidinyl or phenylpiperidinyl heterocyclic ring.

3,946,008
SUBSTITUTED BENZOPYRANO[3,4-C]PYRIDINES

Richard E. Brown, Hanover, and John Shavel, Jr., Mendham, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 343,613, March 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 122,498, March 9, 1971. This application Dec. 19, 1974, Ser. No. 534,502
Int. Cl.² C07D 295/04
U.S. Cl. 260—247.2 B 9 Claims

1. A compound of the formula:



I

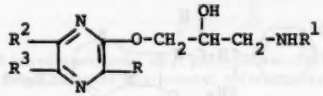
wherein R_1 and R_2 are hydrogen, a hydroxyl group or a lower alkoxyl group of from 1 to 6 carbon atoms; and X is an oxygen atom, a sulfur atom, a methylene group or a nitrogen atom substituted by hydrogen, a lower alkyl group of from 1 to 6 carbon atoms or a lower alkanoyl of 1 to 6 carbon atoms.

3,946,009
2-(3-SUBSTITUTED AMINO-2-HYDROXYPROPOXY)-3-SUBSTITUTED PYRAZINES

Burton Kendall Wasson, Valois, Canada, and Leonard M. Weinstock, Belle Mead, N.J., assignors to Merck Sharp & Dohme (I.A.) Corporation, Rahway, N.J.

Continuation-in-part of Ser. No. 341,421, March 15, 1973, abandoned. This application Oct. 19, 1973, Ser. No. 408,032
Claims priority, application Canada, May 5, 1972, 141471
Int. Cl.² C07D 295/00
U.S. Cl. 260—247.5 D 7 Claims

1. A pyrazine compound having the structure



or a pharmacologically acceptable salt thereof wherein

R represents phenyl, substituted phenyl wherein the substituent is C_{1-3} alkyl, C_{1-3} alkoxy, amino, nitro or halo, phenyl-C_{1-3}-alkyl, hydroxyphenyl-C_{1-3}-alkyl, phenoxy or substituted phenoxy wherein the substituent is C_{1-3} alkyl, C_{1-3} alkoxy, amino, nitro or halo;

R^1 represents a straight or branched chain C_{3-6} alkyl, a straight or branched chain hydroxy substituted C_{3-6} alkyl, a straight or branched chain C_3 alkinyl, phenyl-C_1 alkyl or indolyl-C_{1-6}-alkyl;

R^2 represents hydrogen, C_1'alkyl, C_{3-7} cycloalkyl or an N-containing heterocycle selected from the group consisting of 1-pyrrolidinyl, piperidino, hexahydroazepinyl, morpholino, thiomorpholino, imidazolyl, pyrazolyl and thiazolyl; and

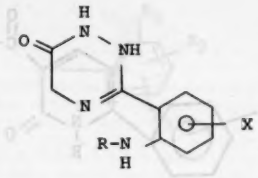
R^3 is N-containing heterocycle selected from the group consisting of 1-pyrrolidinyl, piperidino, hexahydroazepinyl, morpholino, thiomorpholino, imidazolyl, pyrazolyl and thiazolyl.

3,946,010
3-PHENYL-2,5-DIHYDRO-AS-TRIAZIN-6 (1H)-ONES

Peter C. Wade, Pennington, N.J., and B. Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 9, 1975, Ser. No. 566,552
Int. Cl.² C07D 253/06
U.S. Cl. 260—248 AS 5 Claims

1. A compound of the structure



wherein R is selected from the group consisting of lower alkyl, phenyl and benzyl, and X is selected from the group consisting of hydrogen, halogen, nitro, cyano, trifluoromethyl, lower alkyl, lower alkoxy and lower alkylthio, tautomers thereof, and pharmaceutically acceptable acid-addition salts thereof.

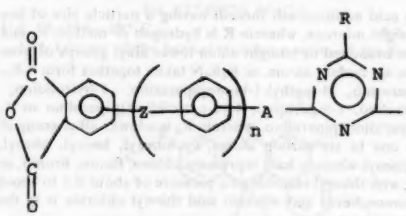
3,946,011

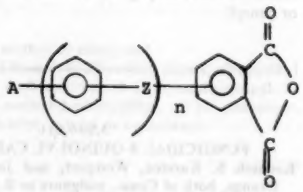
S-TRIAZINE TETRACARBOXYLIC ACIDS AND DIANHYDRIDES

David A. Gordon, Scarsdale, and Raymond Seltzer, New City, both of, NY, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 17, 1974, Ser. No. 489,225
Int. Cl.² C07D *251/26, 251/52*
U.S. Cl. 260—249.6 **6 Claims**

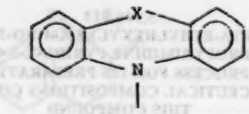
1. An s-triazine dianhydride having the formula



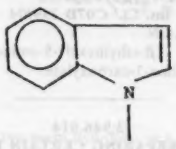


wherein

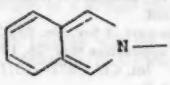
R is hydrogen; alkyl of up to 8 carbon atoms; cycloalkyl of 3 to 6 carbon atoms; phenyl; naphthyl; biphenyl; anthracyl; phenyl or naphthyl substituted by nitro, halo, carboxyl, cyano, lower alkyl of up to 4 carbon atoms; hydroxy or lower alkoxy of up to 4 carbon atoms; benzyl; 1-phenylhexyl; 1-phenylethyl; amino; dinaphthylamino; diphenylamino; N-naphthyl anilino; di(lower)alkylamino where each alkyl has up to 4 carbon atoms; alkylamino of 1 to 8 carbon atoms; anilino; N-(lower) alkylanilino where the alkyl has up to 4 carbon atoms; phenoxy; alkoxy of up to 8 carbon atoms; thioalkoxy of up to 8 carbon atoms; thiophenoxy; mercapto; halo; hydroxyl; carboxyl; morpholino; pyrrolidino; piperidino; a group having the structure



where X is a covalent bond (9-carbazolyl group), oxygen (10-phenoxazinyl group) and sulfur (10-phenothiazinyl group), a 1-indolyl group having the structure



a 2-isoindolyl group having the structure



a 1-imidazolyl group having the structure

or a 1-pyrroloyl group having the structure

A is NH, O, or S;
Z is the direct bond, O, S, SO_2,

or CH_2; and *n* is 0 or 1.

3,946,012

6-L-DIHYDROXYETHYL-2,4,7-TRIOXO-8-D-RIBITYL PTERIDINE AND PROCESS FOR PRODUCING THE SAME

Masuichi Takino, Nara; Teikichi Kurosaki, and Munehiko Odaka, both of Osaka, all of Japan, assignors to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

Filed Sept. 13, 1973, Ser. No. 396,810
Claims priority, application Japan, Sept. 13, 1972, 47-91907
Int. Cl.² C07D *475/02*
U.S. Cl. 260—251.5 **1 Claim**

1. The compound 6-L-dihydroxyethyl-2,4,7-trioxo-8-D-ribityl pteridine.

3,946,013

1,3-BIS(BETA-ETHYLHEXYL)-5-AMINO-5-METHYL-HEXAHYDROPYRIMIDINE-PYRIDINE-3-CARBOXYLATE, PROCESS FOR ITS PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THIS COMPOUND

Manfred Tauscher; Joachim Göring, both of Gronau; Wolfgang Busch, Alfeld, and Oskar Rohte, Kheden, all of Germany, assignors to Johann A. Wulfing, Dusseldorf and Neuss, Germany

Filed Feb. 28, 1974, Ser. No. 446,925

Claims priority, application Germany, Mar. 1, 1973, 2310337; Mar. 1, 1973, 2310338

Int. Cl.² C07D *239/04*

U.S. Cl. 260—256.4 N 1 Claim

1. 1,3-Bis (β-ethylhexyl)-5-amino-5-methylhexahydropyrimidinepyridine-3-carboxylate.

3,946,014

PROCESS FOR PREPARING CERTAIN 1,3,4-DIOXAZOL-ONES AND PRODUCTS

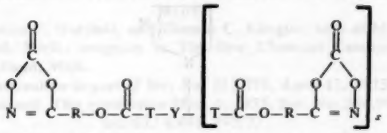
Karl E. Fuger, Allschwil, Switzerland, and Emmett H. Burk, Jr., Glenwood, Ill., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 85,821, Oct. 30, 1970, abandoned. This application Mar. 26, 1973, Ser. No. 344,678

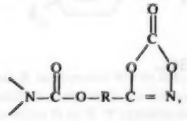
Int. Cl.² C07D *295/14*

U.S. Cl. 260—268 C 11 Claims

1. A cyclic nitrile carbonate group-containing compound of the formula:



wherein R is aliphatic hydrocarbon of 2 to 11 carbon atoms, at least 2 carbon atoms of which separate the non-ring oxygen atom from the nitrile carbon atom, Y is an essentially hydrocarbonaceous organic radical free of groups that would be reactive with the nitrile carbonate groups and has a molecular weight of up to about 9,900, x is 1 to 3 and T is O, S, NR′ or



R′ being hydrogen or an essentially hydrocarbonaceous organic radical free of groups that would be reactive with the cyclic nitrile carbonate groups having up to 10 carbon atoms, which radical is either monovalent and bonded only to the nitrogen atom of T, or is divalent and either (a) bonded to Y as well as to the nitrogen atom of T or (b) bonded to another nitrogen atom of another T as well as to said first nitrogen atom of said first T.

3,946,015

PROCESS FOR THE PREPARATION OF ACID CHLORIDES

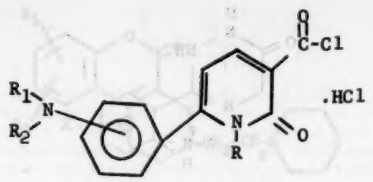
Om P. Goel, Detroit, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed July 11, 1974, Ser. No. 487,525

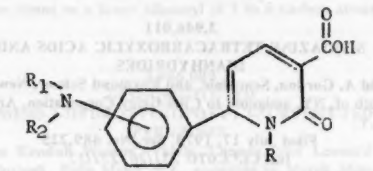
Int. Cl.² C07D *419/14*, *413/04*, *413/14*, *401/04*

U.S. Cl. 260—268 H 4 Claims

1. A process for the production of a 6-(disubstituted amino)phenyl-1,2-dihydro-2-oxonicotinyl chloride hydrochloride having the formula



which comprises reacting a compound of the formula



or an acid addition salt thereof having a particle size of less than eight microns, wherein R is hydrogen or methyl; R_1 and R_2 are branched or straight chain lower alkyl groups of from one to six carbon atoms, or R_1R_2N taken together form 4-R_3-1-piperazino, 4-methyl-1-homopiperazino, 1-pyrrolidino, morpholino, 1-piperidino, 4-(1-pyrrolidino)piperidino or 4-(1-piperidino)piperidino, wherein R_3 is a lower alkyl group of from one to six carbon atoms, cyclohexyl, benzyl, phenyl, halophenyl wherein halo represents chloro, fluoro, bromo, or iodo, with thionyl chloride at a pressure of about 0.1 to about 0.5 atmospheres and wherein said thionyl chloride is in the gaseous phase.

2. The process of claim 1 wherein R is hydrogen and R_1R_2N taken together form 4-R_3-1-piperazino and R_3 is a straight or branched lower alkyl group of from one to six carbon atoms or benzyl.

3,946,016

FUNGICIDAL 8-QUINOLYL CARBANILATES

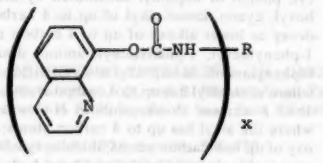
Kenneth S. Karsten, Westport, and Joseph V. Karabinos, Orange, both of Conn., assignors to R. T. Vanderbilt Company, Inc., East Norwalk, Conn.

Filed Mar. 16, 1973, Ser. No. 342,048

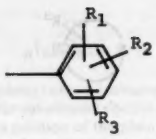
Int. Cl.² C07D *215/34*

U.S. Cl. 260—287 L 2 Claims

1. A compound of a formula



where $x = 1$, R is



where R_1 is selected from the group consisting of methoxy, ethoxy and methylthio; R_2 is selected from the group consisting of H, methoxy, chloro, methyl or nitro; and R_3 is selected from the group consisting of H or chloro.

3,946,017

LACTONES OF THE BENZAXANTHERE SERIES AND DYE-FORMING COMPONENTS FOR USE IN DUPLICATION PROCESSES

Ernst Schefczik, Ludwigshafen, and Hellmut Kast, Bobenheim-Roxheim, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

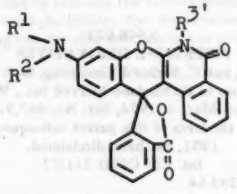
Filed Jan. 24, 1974, Ser. No. 436,043

Claims priority, application Germany, Jan. 25, 1973, 2303483

Int. Cl.² C07D 491/22

U.S. Cl. 260—287 C **6 Claims**

1. A lactone of the benzazaxanthene series of the formula



wherein

R^1 and R^2 denote methyl or ethyl, and

R^3 denotes alkyl of from 1 to 20 carbon atoms, alkoxyalkyl of from 2 to 12 carbon atoms, 3-diethylaminopropyl, 2-phenylethyl, 2-methyl-2-phenylethyl, 3-(2'-phenoxyethoxy)-propyl, o-tolyl, p-tolyl or cyclohexyl.

3,946,018

1,4-DIHYDRO-3 (2H)-ISOQUINOLINONE DERIVATIVES

Gyula Deák; Margit Dóda; Lajos György; László Hazai, all of Budapest, Hungary, and Klára Pfeifer, deceased, late of Budapest, Hungary (by György Mihaly, residuary legatee), assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

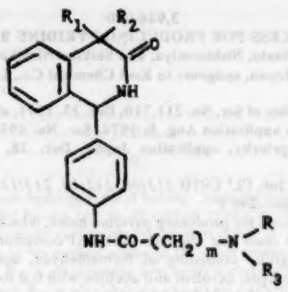
Filed Feb. 5, 1974, Ser. No. 439,823

Claims priority, application Hungary, Feb. 12, 1973, EE 2093; Nov. 13, 1973, EE 2093

Int. Cl.² C07D 217/24

U.S. Cl. 260—287 D **3 Claims**

1. A compound of the formula



wherein

R_1 and R_2 each represent hydrogen or a straight-chained or branched C_{1-3} alkyl group,

R stands for hydrogen or a straight-chained or branched C_{1-4} alkyl group,

R_3 stands for hydrogen or a straight-chained or branched C_{1-4} alkyl group and

R and R_3 may form together with the adjacent nitrogen atom pyrrolidino, piperidino or merphalino,

m is one,

or a pharmaceutically acceptable acid addition salt thereof.

3,946,019

7H-INDOLIZINO [5,6,7-IJ]ISOQUINOLINE DERIVATIVES

Daniel Farge, Thiais; Yves le Goff, Breitgny-sur-Orge; Mayer Naoum Messer, Bievres, and Gilbert Poiget, Thiais, all of France, assignors to Rhone-Poulenc, S.A., Paris, France

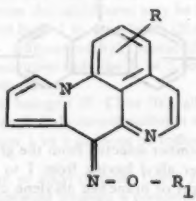
Filed July 25, 1974, Ser. No. 491,642

Claims priority, application France, July 27, 1973, 73.27649; Nov. 22, 1973, 73.41616; May 30, 1974, 74.18808

Int. Cl.² C07D 471/16, 471/18

U.S. Cl. 260—287 P **11 Claims**

1. A compound of the formula:



wherein R represents hydrogen, halogen, or alkoxy of 1 through 4 carbon atoms, and R_1 represents hydrogen, or alkyl of 1 through 4 carbon atoms mono substituted by a member of the class consisting of carboxy, alkoxycarbonyl in which the alkoxy moiety has 1 through 7 carbon atoms, and carbamoyl, or R_1 represents phenylalkyl in which the alkyl moiety has 1 through 4 carbon atoms and is mono substituted by a member of the class consisting of carboxy, alkoxycarbonyl in which the alkoxy moiety has 1 through 4 carbon atoms, and carbamoyl, or R_1 represents alkanoyl of 1 through 4 carbon atoms or benzoyl, and pharmaceutically-acceptable salts of a said compound wherein R_1 is substituted by carboxy.

3,946,020

PROCESS FOR PRODUCING PYRIDINE BASES

Yoshizo Minato, Nishinomiya, and Shikibu Nishikawa, Osaka, both of Japan, assignors to Koei Chemical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 211,710, Dec. 23, 1971, abandoned.
This application Aug. 5, 1974, Ser. No. 495,001
Claims priority, application Japan, Dec. 28, 1970, 46-130303
Int. Cl.² C07D 213/08, 213/10, 213/12
U.S. Cl. 260—290 P 5 Claims

1. A process for producing pyridine bases, which comprises reacting at least one aliphatic carbonyl compound selected from the group consisting of formaldehyde, acetaldehyde, propionaldehyde, acrolein and acetone with 0.2 to 5 moles of ammonia per mole of the total carbonyl compounds in a gas phase at 350°C to 550°C at atmospheric pressure at a space velocity of 100 to 10,000 hr^{-1} in the presence of a catalyst consisting essentially of 95 to 70% by weight of silica and 5 to 30% by weight of alumina obtained by immersing silica-alumina in an aqueous solution of ammonium chloride, ammonium bromide or ammonium iodine at 25 to 80°C for 30 minutes to 5 days, washing with water, drying and calcining at 300°C or higher.

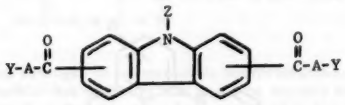
3,946,021

BIS-BASIC KETONES OF CARBAZOLE

William L. Albrecht, and Robert W. Fleming, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Continuation of Ser. No. 57,780, July 23, 1970, abandoned.
This application June 28, 1973, Ser. No. 374,350
Int. Cl.² C07D 295/12
U.S. Cl. 260—293.61 8 Claims

1. A compound selected from a base of the formula



wherein Z is a member selected from the group consisting of hydrogen or lower alkyl having from 1 to 4 carbon atoms; each A is a straight or branched alkylene chain having from 1 to 6 carbon atoms; and each Y is a member selected from the group consisting of

(A.) the group

wherein R^1 and R^2 are individually selected from the group consisting of hydrogen or lower alkyl having from 1 to 4 carbon atoms; of

(B.) the group

wherein n is a whole integer of 4 or 5, and R^3 is selected from the group consisting of hydrogen or lower alkyl having from 1 to 4 carbon atoms and can be linked to any one of the carbon atoms of the heterocyclic group; or

(C.) the group

wherein X is oxygen or NR^4, and R^4 is selected from the group consisting of hydrogen or lower alkyl of from 1 to 4 carbon atoms; or a pharmaceutically acceptable acid addition salt of said base.

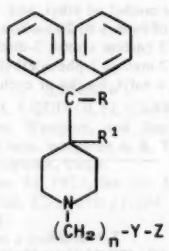
3,946,022

PIPERIDINE DERIVATIVES

Albert A. Carr, and C. Richard Kinsolving, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Mar. 4, 1974, Ser. No. 447,926
The portion of the term of this patent subsequent to Apr. 23, 1991, has been disclaimed.
Int. Cl.² C07D 211/22
U.S. Cl. 260—293.64 19 Claims

1. A compound selected from a base of the formula



wherein R is selected from hydrogen or hydroxy; R^1 is hydrogen; or R and R^1 taken together form a second bond between the carbon atoms bearing R and R^1; n is the integer 4 or 5; Y is selected from

or

Z is selected from phenyl or a substituted phenyl ring wherein the substituent on the substituted phenyl ring is attached at the ortho, meta, or para position of the phenyl ring and is selected from halogen, a straight or branched alkyl group of from 1 to 6 carbon atoms, an alkoxy group of from 1 to 6 carbon atoms, a cycloalkyl group of from 3 to 6 carbon atoms, a di(lower)alkylamino group, or a saturated monocyclic heterocyclic group selected from pyrrolidino, piperidino, morpholino, or N-(lower)alkylpiperazino; or a pharmaceutically acceptable acid addition salt thereof.

3,946,023

MANUFACTURE OF 1,1'-DIALKYL-4,4'-BIPYRIDYLIUM SALTS

John Reginald Case, and Geoffrey James Moore, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 357,655, May 7, 1973, abandoned. This application Mar. 11, 1975, Ser. No. 557,258

Claims priority, application United Kingdom, June 8, 1972, 26804/72

Int. Cl.² C07D *213/74*

U.S. Cl. 260—294.8 R **5 Claims**

1. A method for preparing a 1,1'-diloweralkyl-4,4'-bipyridylium salt by reacting the corresponding 4,4'-bipyridyl with a diloweralkylsulphate, the improvement which comprises carrying out the said reaction in the presence of a mineral acid.

3,946,024

2-HYDROCARBYLOXY-PYRIDINE COMPOUNDS

Erwin Fleckenstein, Hofheim, Taunus; Ernst Heinrich, Frankfurt am Main-Fechenheim, and Reinhard Mohr, Offenbach-Rumpenheim, all of Germany, assignors to Cassella Farbwerke Mainkur AG, Germany

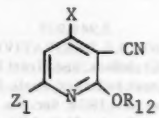
Division of Ser. No. 372,024, June 21, 1973. This application Mar. 31, 1975, Ser. No. 563,848

Claims priority, application Germany, June 22, 1972, 2230392

Int. Cl.² C07D *213/57*

U.S. Cl. 260—294.9 **2 Claims**

1. A compound of the formula



wherein X is alkyl having one to six carbon atoms, alkenyl having two to six carbon atoms, cycloalkyl having three to eight carbon atoms, phenyl, benzyl or phenethyl; Z_1 is

-NH-OR_{10} or

R_5 and R_6 are hydrogen, alkyl having one to six carbon atoms, hydroxyalkyl having one to six carbon atoms, cycloalkyl having three to eight carbon atoms, methoxyalkyl or ethoxyalkyl having one to six carbon atoms in the alkyl moiety, benzyl or phenethyl; R_{10} is alkyl having one to six carbon atoms, benzyl or phenethyl; R_{11} is alkyl having one to six carbon atoms and R_{12} is alkyl having one to six carbon atoms, alkenyl having two to six carbon atoms, cycloalkyl having three to eight carbon atoms, phenyl, benzyl or phenethyl.

3,946,025

PROCESS FOR PREPARING 6H-PYRIDO[1,2-C][1,3,5]BENZOTHIADIAZEPINES AND BENZOOXADIAZEPINES AND DERIVATIVES

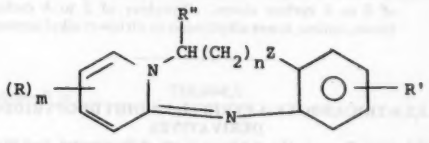
Harry Louis Yale, New Brunswick, N.J., and Ramesh B. Petigara, Lansdale, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 347,938, April 4, 1973, Pat. No. 3,857,850. This application Mar. 29, 1974, Ser. No. 456,402

Int. Cl.² C07D *213/32*

U.S. Cl. 260—294.8 B **3 Claims**

1. A method of preparing a compound of the formula



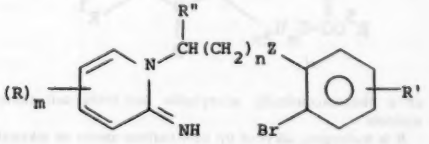
wherein *m* is 1 or 2;

R is the same or different and is hydrogen, halogen (F, Cl, or Br), alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons, alkylthio of from 1 to 4 carbons, benzyl, phenethyl, phenyl, phenoxy, phenylthio or mono-substituted phenyl wherein the substituent may be halogen (F, Cl, Br or I), alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons, or trifluoromethyl; provided that when R is halogen, R occupies only the 3- or 5-position in the original 2-aminopyridine;

R' is hydrogen, halogen (F, Cl or Br), alkyl of from 1 to 4 carbons, phenyl, dialkylamidosulfonyl wherein each alkyl radical is from 1 to 4 carbons or trifluoromethyl;

n is 0 or 1;

R'' is hydrogen or alkyl of from 1 to 4 carbons and Z is S or SO_2, comprising treating a compound of the formula



wherein R, m, R'', Z and R' are as defined above with a water miscible alcohol and an alkali metal alkoxide of up to 3 carbon

atoms in the presence of copper at a temperature of from about 60°C to about 120°C.

3,946,026

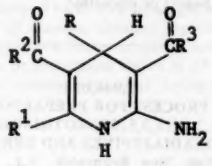
2-AMINO-1,4-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer, Wuppertal; Friedrich Bossert, Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 336,639, Feb. 28, 1973, Pat. No. 3,867,393. This application Oct. 17, 1974, Ser. No. 515,643
Claims priority, application Germany, Mar. 6, 1972, 2210674

Int. Cl.² C07D 213/55
U.S. Cl. 260—295.5 R 4 Claims

1. A compound of the formula:



wherein

R is hydrogen, lower alkyl or alkynyl of 2 to 4 carbon atoms;

R^1 is hydrogen, lower alkyl, phenyl or pyridyl;

R^2 is lower alkoxy, lower alkoxy(lower alkoxy), alkenyloxy of 2 to 4 carbon atoms, alkynyloxy of 2 to 4 carbon atoms, amino, lower alkylamino or di(lower alkyl)amino; and

R^3 is lower alkoxy, lower alkoxy(lower alkoxy), alkenyloxy of 2 to 4 carbon atoms, alkynyloxy of 2 to 4 carbon atoms, amino, lower alkylamino or di(lower alkyl)amino.

3,946,027

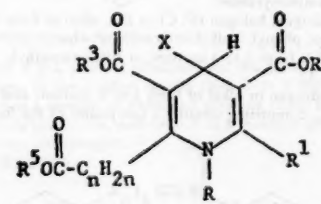
3,5,6-TRICARBOXY-4-PYRIDYL-1,4-DIHYDROPYRIDINE DERIVATIVES

Friedrich Bossert; Horst Meyer, both of Wuppertal, and Wulf Vater, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 399,850, Sept. 24, 1973, Pat. No. 3,905,983. This application Nov. 15, 1974, Ser. No. 523,967
Claims priority, application Germany, Sept. 30, 1972, 2248150

Int. Cl.² C07D 213/55
U.S. Cl. 260—295.5 R 8 Claims

1. A compound of the formula:



or a pharmaceutically acceptable non-toxic salt thereof, wherein

R is hydrogen, alkyl of up to 4 carbon atoms or alkenyl of up to 4 carbon atoms;

R^1 is hydrogen or alkyl of up to 4 carbon atoms; each of R^2 and R^3, taken independently of the other, is alkyl of up to 4 carbon atoms, hydroxy alkyl of up to 4 carbon atoms, alkoxy alkyl of up to 4 carbon atoms, alkenyl of up to 4 carbon atoms or alkynyl of up to 4 carbon atoms;

R^5 is hydrogen or alkyl of up to 4 carbon atoms; and

X is pyridyl unsubstituted or substituted by one or two members selected from the group consisting of alkyl of up to 4 carbon atoms, alkoxy of up to 4 carbon atoms, and halogeno; and

n has a value of 0 to 3.

3,946,028

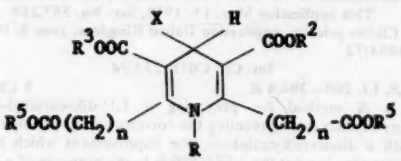
2,3,5,6-TETRACARBOXY-4-PYRIDYL-1,4-DIHYDROPYRIDINE DERIVATIVES

Friedrich Bossert; Horst Meyer, both of Wuppertal, and Wulf Vater, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 399,850, Sept. 24, 1973, Pat. No. 3,905,983. This application Nov. 15, 1974, Ser. No. 524,090
Claims priority, application Germany, Sept. 30, 1972, 2248150

Int. Cl.² C07D 213/55
U.S. Cl. 260—295.5 R 4 Claims

1. A compound of the formula:



or a pharmaceutically acceptable nontoxic salt thereof, wherein

R is hydrogen, alkyl of up to 4 carbon atoms or alkenyl of up to 4 carbon atoms;

R^2 is alkyl of up to 6 carbon atoms, alkenyl of up to 6 carbon atoms, said alkyl substituted by hydroxyl, said alkenyl substituted by hydroxyl, said alkyl interrupted by oxygen or said alkenyl interrupted by oxygen;

R^3 is alkyl of up to 6 carbon atoms or alkenyl of up to 6 carbon atoms;

R^5 is hydrogen or alkyl of 1 to 4 carbon atoms;

n is 0, 1, 2 or 3; and

X is pyridyl unsubstituted or substituted by one or two members selected from the group consisting of alkyl of up to 4 carbon atoms, alkoxy of up to 4 carbon atoms and halogeno.

3,946,029

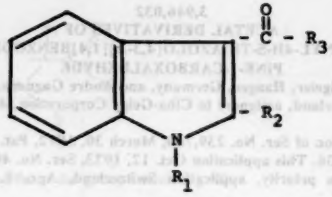
INDOLE DERIVATIVES

Margel Descamps, Crainhem, and Henri Inion, Wemmel, both of Belgium, assignors to Labaz, Paris, France

Filed Jan. 31, 1974, Ser. No. 438,214
Claims priority, application United Kingdom, Feb. 16, 1973, 7866/73

Int. Cl.² C07D 401/02, 401/14
U.S. Cl. 260—296 B 3 Claims

1. An indole derivative of the formula:



or a pharmaceutically acceptable acid addition salt thereof, wherein R_1 represents s

straight- or branched-chain saturated alkyl having not more than 6 carbon atoms, allyl, or benzyl optionally substituted in the aromatic portion by chlorine or methoxy,

R_2 represents

branched- or straight-chain alkyl having from 1 to 4 carbon atoms, cyclohexyl, or phenyl optionally substituted by fluorine, chlorine, bromine or methoxy; and R_3 represents 2-pyridyl, 3-pyridyl or 4-pyridyl.

3,946,030
2-MERCAPTOARYLTHIOAZOLE PRODUCTION

Howard W. Bost, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 1, 1974, Ser. No. 493,749
Int. Cl.² C07D *277/72*
U.S. Cl. 260—306 **11 Claims**

1. A process for the production of 2-mercaptoarylthiazoles which comprises reacting

a. at least one primary aryl amine having a replacable hydrogen on a carbon atom adjacent to the carbon atom to which the amino group is bonded selected from aniline, alkyl-substituted anilines, α- and β-naphthyl amines, and alkyl-substituted α- and β-naphthyl amines wherein the alkyl substituents contain from one to six carbon atoms per group and the primary aryl amine contains from six to 16 carbon atoms per molecule with

b. sulfur and

c. at least one nitrogen-containing compound having a formula selected from

(I)

and

(II)

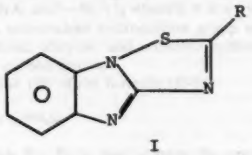
wherein Y = O, S, or NH; and Z = OR, SR, NH_2, NHR, and NR_2; where R is a hydrocarbyl radical selected from alkyl, aryl, and cycloalkyl radicals having up to eight, inclusive, carbon atoms, and compounds selected from the group consisting of alkaline earth cyanamides, alkali metal cyanamides, dicyanodiamide, and ammonium thiocyanate which are convertible to compounds of Formulas I and II, under reaction conditions of a temperature in the range of 200°–350°C and a pressure up to 1,200 psig and in the presence of from 0.01 to 5 moles of nitrogen-containing compound per mole of primary aryl amine which produce 2-mercaptoarylthiazoles.

3,946,031
2-SUBSTITUTED-1,2,4-THIADIAZOLO-[2,3-A]-BENZIMIDAZOLES

Colin C. Beard, Palo Alto, Calif., assignor to Syntex Inc., Palo Alto, Calif.

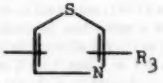
Division of Ser. No. 403,474, Oct. 4, 1973, Pat. No. 3,880,874.
This application Nov. 14, 1974, Ser. No. 523,765
Int. Cl.² C07D *277/60*
U.S. Cl. 260—306.8 F **11 Claims**

1. A compound represented by the formula:



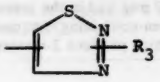
I

wherein R is



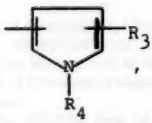
,

,

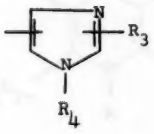


,

,



, and



in which

R_3 is hydrogen, lower alkoxy, halo, nitro, or lower alkyl;

R_4 is hydrogen or lower alkyl; and

the pharmaceutically acceptable salts thereof.

3,946,032

ACETAL DERIVATIVES OF 6-PHENYL-4H-S-TRIAZOLO[4,3-A][1,4]BENZODIAZEPINE-1-CARBOXALDEHYDE

Hans Allgeier, Haagen, Germany, and Andre Gagneux, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

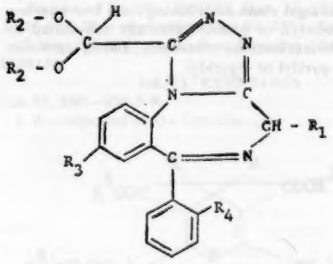
Division of Ser. No. 239,780, March 30, 1972, Pat. No. 3,867,536. This application Oct. 12, 1973, Ser. No. 406,060

Claims priority, application Switzerland, Apr. 8, 1971, 5233/71

Int. Cl.² C07D *487/04*

U.S. Cl. 260—308 R **11 Claims**

1. A compound having the formula I a,



(I a)

wherein

R_1 represents a hydrogen atom or a methyl or ethyl group,

each of the symbols R_2 represents a methyl or ethyl group, and

R_3 and R_4, independently of each other, represents hydrogen, a chlorine, fluorine or bromine atom, or a nitro or trifluoromethyl group, at least one of the symbols R_3 and R_4 being other than hydrogen,

as well as the 5-oxide thereof.

3,946,033

PROCESS FOR THE PREPARATION OF HYDANTOIN DERIVATIVES

Kaoru Iwata, and Shigeyoshi Hara, both of Hino, Japan, assignors to Teijin Ltd., Osaka, Japan

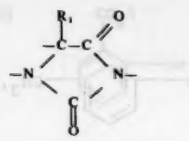
Filed Nov. 20, 1973, Ser. No. 417,566

Claims priority, application Japan, Nov. 24, 1972, 47-117096; Dec. 18, 1972, 47-126191

Int. Cl.² C07D *233/54*

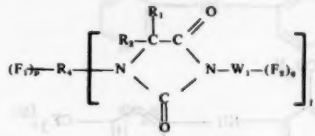
U.S. Cl. 260—309.5 **11 Claims**

1. A process for making monomeric hydantoin derivatives containing in their molecules at least one hydantoin ring (H) of the formula (H) below:

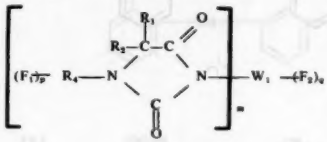


(H)

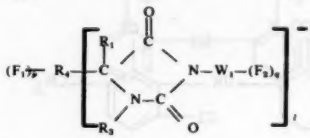
selected from the group consisting of



(IV-1),

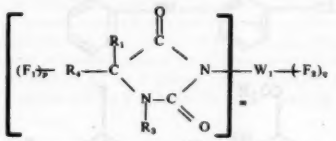


(IV-2),



(IV-3),

and



(IV-4)

wherein R_1, R_2 and R_3 may be the same or different and each denotes a hydrogen atom or a monovalent organic group selected from aliphatic groups of 1 to 20 carbon atoms, alicyclic groups of 3 to 20 carbon atoms and aromatic groups of 6 to 20 carbon atoms, said organic group optionally containing one or two hetero-elements selected from oxygen, nitrogen, and sulfur,

R_4 denotes hydrogen atom or a $(l+p)$valent saturated or unsaturated aliphatic, alicyclic, aromatic, or heterocyclic group of 1 to 20 carbon atoms, which may contain 1 to 4 hetero-elements selected from oxygen, nitrogen, sulfur, phosphorus, or silicon atoms, the $(l+p)$ valency bonding with the carbon atoms,

W_1 denotes hydrogen atom or a $(m+q)$ valent saturated or unsaturated aliphatic, alicyclic, aromatic, or heterocyclic group of 1 to 20 carbon atoms, which may contain 1 to 4 hetero-elements selected from oxygen, nitrogen, sulfur, phosphorus, or silicon atoms, the $(m+q)$ valency bonding with carbon atoms,

l is an integer of 1 to 5,

p is an integer of 0 to 5,

m is an integer of 1 to 5,

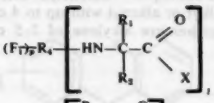
q is an integer of 0 to 5,

F_1 and F_2 may be the same or different and each denotes halogen atom, nitro group ($-NO_2$), nitrile group ($-CN$), tertiary amino group,

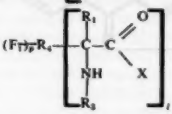
$-OY$, $-SY$, $-COY$, $-OCOY$, and $-COOY$ wherein Y and Y′ may be the same or different, and each denotes hydrogen atom or a monovalent organic radical selected from aliphatic, alicyclic, and aromatic hydrocarbon residues of 1 to 20 carbon atoms, which may contain 1 to 4 hetero atoms selected from oxygen, nitrogen, and sulfur,

which comprises reacting

1. a glycine derivative (I) of the formula (I-1) or (I-2) below:



(I-1)

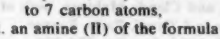


(I-2)

in which F_1, p, R_1, R_2, R_3, R_4, and l have the previously given meanings, and

X is selected from the group consisting of $-OA$, $-SA$, $-NHA$, and $-N(A)_2$ wherein A is a hydrogen atom or a monovalent hydrocarbon group selected from aliphatic, alicyclic and aromatic hydrocarbons of 1 to 7 carbon atoms,

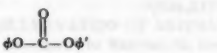
2. an amine (II) of the formula (II-1)



(II-1)

in which W_1, F_2, q, and m have the previously given meanings, and

3. a diaryl carbonate (III) of the formula



(III)

in which ϕ and ϕ' may be the same or different, and each stands for a monovalent aromatic radical

with the proviso that

4. the above three reactants are selected such that at least one of l and m is 1; whereby when l and m are each 1 the compounds of formulae (IV-1) and (IV-2) and the compounds of formulae (IV-3) and (IV-4) respectively become identical and when l is 2 to 5 and m is 1 a compound of formula (IV-1) or (IV-3) is obtained and when m is 2 to 5 and l is 1 a compound of formula (IV-2) or (IV-4) is obtained.

3,946,034

ADDUCTS OF POLYGLYCIDYL COMPOUNDS AND DIALKOXYPHOSPHONO-ALKYL DERIVATIVES OF CYCLIC UREIDES

Daniel Porret, Binningen, and Jürgen Habermeier, Pfeffingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

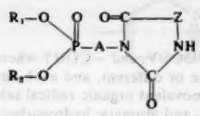
Filed Dec. 7, 1973, Ser. No. 423,050

Claims priority, application Switzerland, Dec. 12, 1972, 18032/72

Int. Cl.² C07D *49/32*

U.S. Cl. 260—309.5 **5 Claims**

1. An adduct, containing epoxide groups, consisting essentially of the reaction product of a polyglycidyl compound selected from the group consisting of polyglycidyl compounds of cyclic ureides, polyglycidyl compounds of bisphenol A, and a cycloaliphatic polyglycidyl compound and a compound of the formula



wherein Z is methylene, methylene substituted by alkyl groups of 1-6 carbon atoms, cyclopentylidene or cyclohexylidene; A is alkylene of 1-12 carbon atoms, or $-CH_2CH_2O\ CH_2CH_2-$; and R_1 and R_2 each is alkyl or alkenyl with up to 4 carbon atoms, or R_1 and R_2 together are alkylene of 2-5 carbon atoms.

3,946,035

ANTI-INFLAMMATORY POLYMERS, PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME AND PROCESS FOR PRODUCING SAID POLYMERS

Bernard Jacquet, Antony; Christos Papantoniou, Epinay-sur-Seine; Pierre Dufaure, and Claude Mahieux, both of Paris, all of France, assignors to L'Oreal, Paris, France

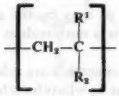
Filed June 27, 1973, Ser. No. 374,060

Claims priority, application Luxemburg, June 29, 1972, 65622; June 29, 1972, 65621

Int. Cl.² C07D *209/18*

U.S. Cl. 260—243 A **13 Claims**

1. A polymeric compound containing repeating units of the formula



wherein R^1 and R^2 are selected from the group of values consisting of

a. R_2 is $-[O-CO-CH_2]_n-O-Z$, R^1 is hydrogen and n is 1–10,

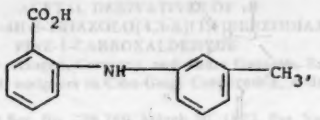
b. R_2 is $-CH_2-O-CO-CH_2-O-Z$ and R^1 is hydrogen or methyl,

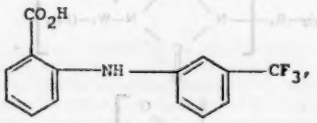
c. R_2 is $-CH_2-NH-CO-CH_2-O-Z$ and R^1 is hydrogen,

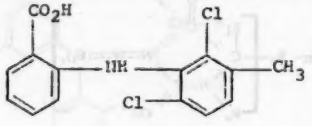
d. R_2 is $-CO-NH-CH_2-NH-CO-CH_2-O-Z$ and R^1 is hydrogen, and

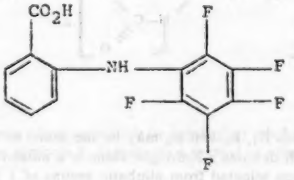
e. R_2 is $-O-CO-CH_2-\overset{\oplus}{N}(r)(r')-(CH_2)_2-O-Z, Y^{\ominus}$

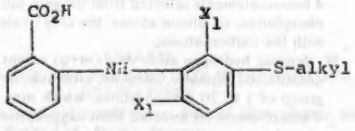
wherein r and r' represent alkyl having 1–3 carbon atoms, Y represents chlorine or bromine and R^1 is hydrogen or methyl, and Z is the acyl residue of an anti-inflammatory carboxylic pharmaceutical agent selected from the group consisting of

(1) 

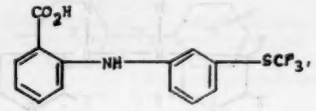
(2) 

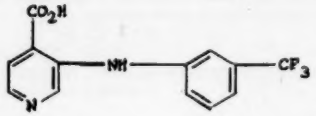
(3) 

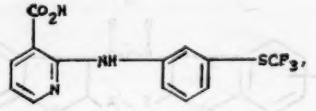
(4) 

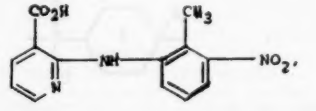
(5) 

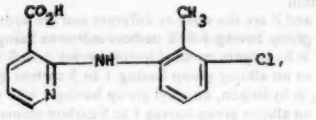
wherein X_1 represents Cl, Br, F or I and said alkyl has 1–3 carbon atoms,

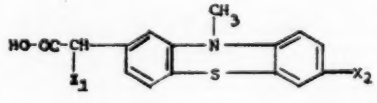
(6) 

(7) 

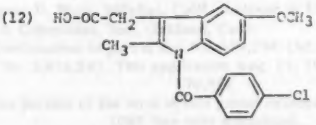
(8) 

(9) 

(10) 

(11) 

wherein Z_1 is selected from the group consisting of hydrogen and methyl, and X_2 is selected from the group consisting of hydrogen and methoxy,

(12)  and

(13)

3,946,036

6,11-DIHYDRO-11-OXO-DIBENZO[B,E]THIEPINE-2-ACETIC ACIDS

Fulvio Gadient, Birsfelden, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

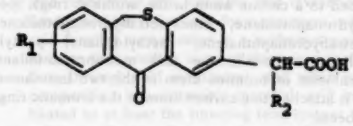
Filed Sept. 9, 1974, Ser. No. 504,428

Claims priority, application Switzerland, Sept. 13, 1973, 13178/73; Sept. 13, 1973, 13179/73; May 9, 1974, 6366/74

Int. Cl.² C07D *337/12*

U.S. Cl. 260—327 B 6 Claims

1. A compound of the formula:

 I

wherein

R_1 is hydroxyl, lower alkoxy, amino or acetamino, and

R_2 is hydrogen or lower alkyl,

or a pharmaceutically acceptable salt thereof.

3,946,037

SULFONATION OF AROMATIC COMPOUNDS

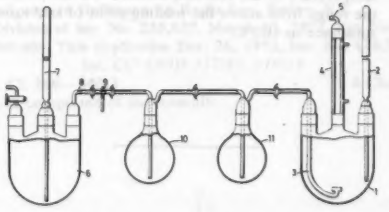
Adolf Koebner, The Retreat, St. Bees, Cumberland, England

Filed Oct. 30, 1973, Ser. No. 411,054

Claims priority, application United Kingdom, Oct. 30, 1972, 49928/72

Int. Cl.² C07D *333/00*; C07C *143/24*

U.S. Cl. 260—329 S 3 Claims



1. A process for the sulfonation of aromatic substances and mixtures thereof selected from the group consisting of benzene, toluene, ethyl-benzene, fluorobenzene, chlorobenzene, bromobenzene, iodobenzene, nitrobenzene, pentamethyl-benzene, octyl-benzene, cumene, pseudo-cumene, para-cymene, mesitylene, anisole, phenetole, thiophene, naphthalene, tetrahydronaphthalene and indane, and all isomeric forms of xylene, ethyl-toluene, fluorotoluene, monochlorotoluene, monobromotoluene, monoiodotoluene, dichlorobenzene, trichlorobenzene, tetrachlorobenzene, tetrafluorobenzene, dibromobenzene, diethoxybenzene, nitrotoluene, monochlorotoluene,

monobromotoluene, bromoxylene, dibromoxylene, dibromotoluene, iodotoluene, iodoxylene, chlorophenetole, nitroanisole, monochloronitrobenzene, methylthiophene, dimethylthiophene, ethylthiophene, octyl thiophene, monochlorothiophene, monobromothiophene, monoiodothiophene, monofluorothiophene, monoitrothiophene, methoxy-thiophene, heptoxy-thiophene, methylnaphthalene, monofluoronaphthalene, monochloronaphthalene, dimethylnaphthalene, ethyl naphthalene, monochloromethylnaphthalene, monochloroethylnaphthalene, methyl ethyl naphthalene, isopropylnaphthalene, diethylnaphthalene, methyltetrahydronaphthalene, ethyltetrahydronaphthalene, monofluorotetrahydronaphthalene, monochlorotetrahydronaphthalene, (the fluorine or chlorine atom in the two compounds last named being attached to a carbon atom in the aromatic ring), methoxytetrahydronaphthalene, ethoxytetrahydronaphthalene, dimethoxytetrahydronaphthalene, methyl-indane, pentylindane and monochloro-indane and monobromo-indane where the chlorine or bromine atom in the two last-named compounds is attached to a carbon atom in the aromatic ring, in which process:

1. said aromatic substance is brought to boiling in a reaction chamber at a temperature in the range from above the melting point of said aromatic compound to 100°C, under a pressure of from 0.1 mm Hg to atmospheric pressure,
2. gaseous sulfur trioxide is introduced into the boiling liquid aromatic substance to react exothermically therewith, heat liberated in the exothermic sulfonation reaction causing said liquid aromatic substance to continue to boil and furnishing the latent heat of volatilization of the said liquid aromatic substance,
3. the aromatic substance thus volatilized is reconverted to liquid in a heat-exchanger, so that the latent heat of volatilization is given up in the heat-exchanger and heat liberated in the sulfonation reaction is thus removed from the reaction chamber,
4. the aromatic substance reconverted to liquid in the heat-exchanger is recycled to the reaction chamber,
5. the pressure in the reaction chamber and the rate at which the gaseous sulfur trioxide is introduced into the liquid aromatic substance are so controlled that the aromatic substance is volatilized, reconverted to the liquid state and recycled to the reaction chamber at a rate such as to ensure that the amount of liquid aromatic substance present in the reaction chamber and available for participation in the sulfonation reaction is always in excess of that amount of said aromatic substance capable of reacting with the gaseous sulfur trioxide in contact with the aromatic substance in the reaction chamber and that the temperature of the reaction mixture is a temperature in the range from above the melting point of said aromatic substance to 100°C.

3,946,038

N,N'-BIS(1,1-DIOXOHYDROTHIENYL)DIAMINOALKANES

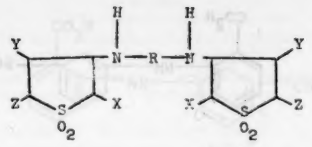
Chung-Ling Mao, Sandy Hook, Conn., and Lynn A. Bakker, Granger, Ind., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 439,192, Feb. 4, 1974. This application Nov. 6, 1974, Ser. No. 521,328

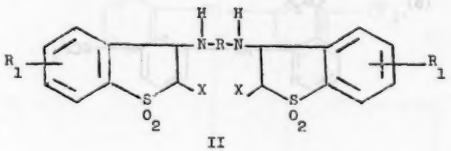
Int. Cl.² C07D *333/66*

U.S. Cl. 260—330.5 **24 Claims**

1. An N,N'-bis(1,1-dioxohydrothienyl)diaminoalkane having one of the following formulas I or II:



I



II

wherein

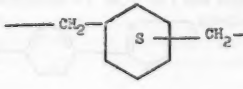
X and Z are the same or different and are hydrogen, an alkyl group having 1 to 5 carbon atoms or halogen,

Y is hydrogen, an alkyl group having 1 to 5 carbon atoms, or an alkoxy group having 1 to 5 carbon atoms;

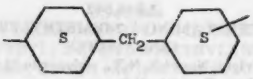
R_1 is hydrogen, an alkyl group having 1 to 5 carbon atoms, an alkoxy group having 1 to 5 carbon atoms or halogen;

R is an alkylene group having 1 to 16 carbon atoms, a cycloalkylene group having 4 to 6 carbon atoms,

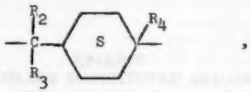
,



,



or



where R_2, R_3 and R_4 are the same or different and are hydrogen or an alkyl group having 1 to 5 carbon atoms.

investing a reticulated organic foam pattern uniformly with an inorganic investment composition containing an alkaline earth salt, oxide or hydroxide, or carbon and a resin from which the air is removed, which is settable to a structurally stable positive of said pattern;

allowing said inorganic investment composition to set to a form retaining investment;

removing said pattern from said investment, by thermal or chemical means, so as to leave a pattern of internal passageways in said investment corresponding to said organic foam pattern;

introducing a forming composition capable of forming cohesive solid structure into said pattern of internal passageways while maintaining a pressure differential across said investment and vibrating said investment, so as to form a solidus reticulated foam structure, wherein when said forming composition is a molten composition, said forming composition is maintained in a molten state to flow through said investment, and when said forming composition is a sinterable material, said investment is heated to at least the sintering temperature to form said solidus reticulated foam structure; and

removing said investment composition to leave a solidus reticulated foam structure of the solidified forming composition.

3,946,039

RETICULATED FOAM STRUCTURE

Duane D. Walz, Milpitas, Calif., assignor to Energy Research & Generation, Inc., Oakland, Calif.

Continuation-in-part of Ser. No. 679,204, Oct. 30, 1967, Pat. No. 3,616,841. This application Aug. 11, 1971, Ser. No. 170,952

The portion of the term of this patent subsequent to Nov. 9, 1988, has been disclaimed.

Int. Cl. C04b *35/60*

U.S. Cl. 264—332 **12 Claims**

1. A method for manufacturing a reticulated foam structure which comprises:

3,946,040

PROPYNYL BENZYL ETHERS

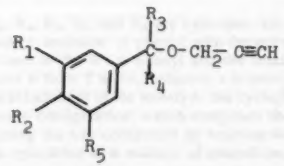
Madhukar Subraya Chodnekar, Basel; Albert Pfiffner, Pfaffhausen; Norbert Rigassi, Arlesheim; Ulrich Schwieter, Reinach, and Milos Suchy, Pfaffhausen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 235,037, March 15, 1972, Pat. No. 3,840,604. This application Dec. 26, 1973, Ser. No. 428,291

Int. Cl.² C07D *317/54, 319/18*

U.S. Cl. 260—340.3 **4 Claims**

1. A compound of the formula:



wherein R_1 and R_2 taken together form a lower alkylenedioxy group having 1 to 4 carbon atoms; R_3 and R_4 are hydrogen or lower alkyl; and R_5 is hydrogen or lower alkoxy.

3,946,041

6-(3,4-METHYLENEDIOXY-6-BENZYLALKYLAMINOETHYLPHENYLACETYL)BENZOIC ACID ALKYL ESTER DERIVATIVES

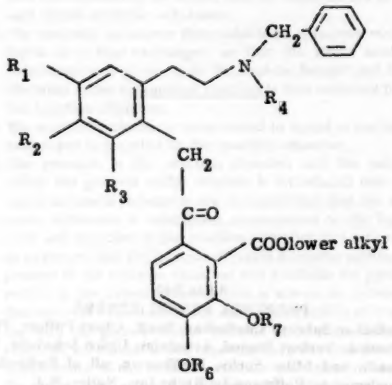
Arnold Brossi, Verona; Wilhelm Kloetzer, East Orange, and Sidney Teitel, Clifton, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 166,582, July 27, 1971, Pat. No. 3,772,327, which is a continuation-in-part of Ser. No. 141,979, May 10, 1971, abandoned. This application Aug. 8, 1973, Ser. No. 386,668

Int. Cl.[2] C07D *317/68*

U.S. Cl. 260—340.5 3 Claims

1. A compound of the formula



wherein R_1 and R_2 taken together are methylenedioxy; R_3 represents hydrogen or lower alkoxy; R_4 represents lower alkyl and R_6 and R_7 represent individually lower alkyl or when taken together are methylene.

3,946,042

3-DIETHYLAMINO-2,2-DIMETHYLPROPYL CINNAMATES

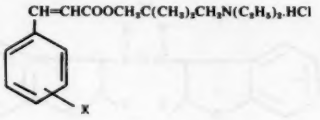
George C. Wright, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed May 23, 1974, Ser. No. 472,730

Int. Cl.[2] C07C *69/76;* C07D *317/68*

U.S. Cl. 260—340.5 4 Claims

1. A compound of the formula:



wherein X is 4-chloro, 3,4-dimethoxy or 3,4-methylenedioxy.

3,946,043

N-ALPHA-CHLOROACETYL-N-(1,3-DIOXAN-2-YLMETHYL)-2,6-DIMETHYLANILINE

Sidney B. Richter, Chicago, and John Krenzer, Oak Park, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed July 26, 1974, Ser. No. 492,128

The portion of the term of this patent subsequent to Jan. 7, 1992, has been disclaimed.

Int. Cl.[2] C07D *319/06;* A01N *9/28*

U.S. Cl. 260—340.7 1 Claim

1. The compound N-α-chloroacetyl-N-(1,3-dioxan-2-ylmethyl)-2,6-dimethylaniline.

3,946,044

N-ALPHA-CHLOROACETYL-N-(1,3-DIOXOLAN-2-YLMETHYL)-2-ETHYL-6-METHYLANILINE

Sidney B. Richter, Chicago, and John Krenzer, Oak Park, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Aug. 1, 1974, Ser. No. 493,805
The portion of the term of this patent subsequent to Jan. 7, 1992, has been disclaimed.
Int. Cl.² C07D 317/32
U.S. Cl. 260—340.9 1 Claim

1. The compound N-α-chloroacetyl-N-(1,3-dioxolan-2-ylmethyl)-2-ethyl-6-methylaniline.

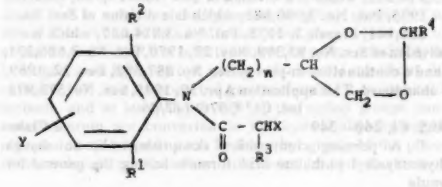
3,946,045

DIOXOLANE SUBSTITUTED ANILIDS

Sidney B. Richter, Chicago, and John Krenzer, Oak Park, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Nov. 13, 1974, Ser. No. 523,388
The portion of the term of this patent subsequent to Jan. 7, 1992, has been disclaimed.
Int. Cl.² C07C 317/30
U.S. Cl. 260—340.9 8 Claims

1. A compound of the formula



wherein Y is selected from the group consisting of hydrogen, lower alkyl and halogen; R^1 is selected from the group consisting of hydrogen, lower alkyl and lower alkoxy; R^2 is lower alkyl; R^3 and R^4 are independently selected from the group consisting of hydrogen and lower alkyl; X is halogen; and *n* is the integer 1 to 2.

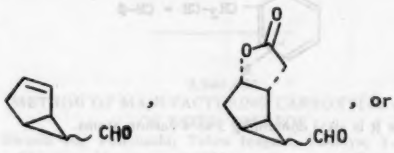
3,946,046

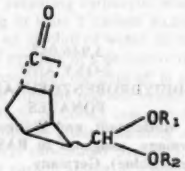
RESOLUTION OF PROSTAGLANDIN INTERMEDIATES BY MEANS OF OXAZOLIDINES

Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 181,246, Sept. 16, 1971, Pat. No. 3,711,515, which is a continuation-in-part of Ser. No. 93,483, Nov. 27, 1970, abandoned. This application Dec. 15, 1972, Ser. No. 315,726
Int. Cl.² C07D 307/83
U.S. Cl. 260—343.3 R 11 Claims

1. A process for resolving a racemic mixture of an oxo compound of the formula





and of the mirror image thereof, wherein R_1 and R_2 are alkyl of one to 4 carbon atoms, inclusive, or, when taken together,

wherein R_3, R_4, R_5, R_6, and R_8 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or phenyl, with the proviso that not more than one of the R's is phenyl and the total number of carbon atoms is from 2 to 10, inclusive; *x* is zero or one, and ~ indicates attachment of the moiety to the cyclopropane ring in exo or endo configuration, which comprises the steps of

a. converting the oxo compound by reaction with an optically active ephedrine to a mixture of oxazolidine diastereomers,

b. separating at least one oxazolidine diastereomer from said mixture,

c. hydrolyzing said oxazolidine to free the optically active oxo compound, and

d. recovering said optically active oxo compound.

3,946,047

ALKYLCINNAMYLPHENOLS AS MOSQUITO LARVICIDES

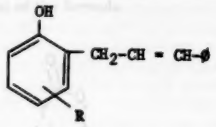
Leonard Jurd, Berkeley, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 27, 1975, Ser. No. 554,057

Int. Cl.² A01N 9/26

U.S. Cl. 424—346 **2 Claims**

1. A method of killing mosquito larvae which comprises applying to said larvae a larvicidal amount of a compound of the formula



wherein R is alkyl containing 3 to 4 carbon atoms.

3,946,048

2-OXY AND 2-THIO-2,3-DIHYDROBENZOFURANYL-5-AMINOSULFONATES

Adolf Fischer, Mutterstadt, and Wolfgang Rohr, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

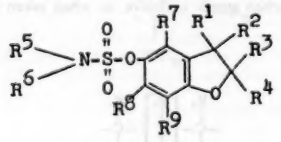
Filed May 13, 1974, Ser. No. 469,063

Claims priority, application Germany, May 16, 1973, 2324592

Int. Cl.² C07D 307/83

U.S. Cl. 260—346.2 R **52 Claims**

1. A substituted benzofuranyl ester of the formula



where R^1, R^2 and R^3 are identical or different and each denotes hydrogen or alkyl of 1 to 3 carbon atoms, or R^1 and R^2 together, or R^2 and R^3 together, denote alkylene of 2 to 5 carbon atoms, R^4 denotes hydroxy, alkoxy of 1 to 5 carbon atoms, alkenyloxy of 2 to 4 carbon atoms, alkynyloxy of 2 to 4 carbon atoms, methylmercapto, ethylmercapto, propylmercapto, benzylmercapto, β-phenylethylmercapto, p-chlorobenzylmercapto, phenoxy, nitrophenoxy, the group $OCOR^{12}$, where R^{12} denotes alkyl of 1 to 4 carbon atoms, allyl, methallyl, propargyl, butynyl, phenyl, tolyl, chlorophenyl, nitrophenyl, methylamino, dimethylamino, methoxy, ethoxy, propoxy, allyloxy, chloroallyloxy, propargyloxy, chlorobutynyloxy, phenylamino, tolylamino, chlorophenylamino or phenoxy, tolyloxy and chlorophenyloxy, R^5 and R^6 are identical or different and each denotes hydrogen, alkyl of 1 to 4 carbon atoms and chloro substituted alkyl of 1 to 4 carbon atoms, and R^7, R^8 and R^9 are identical or different and each denotes hydrogen, methyl, ethyl, chloro, bromo, cyano, acetyl or methoxy.

3,946,049

5-PHENYL-2-FURAMIDOXIMES

Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Apr. 3, 1975, Ser. No. 564,769

Int. Cl.² C07D 307/66

U.S. Cl. 260—347.2 **20 Claims**

1. A compound of the formula:

wherein X represents hydrogen, nitro, amino, 4-chloro, 4-methyl, 4-methylthio, 4-hydroxy, 4-benzyloxy, 4-acetyl, 4-(1-hydroxyethyl), 4-methoxy, and 4-dimethylamino; R represents hydrogen or methyl; and n represents 0, 1, or 2.

3,946,050

FLAVOURING AND PERFUMING INGREDIENTS

Edouard P. Demole, Coppet, Vaud, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Division of Ser. No. 451,423, March 15, 1974. This application Apr. 2, 1975, Ser. No. 564,560

Claims priority, application Switzerland, Apr. 10, 1973, 5122/73; Apr. 12, 1973, 5274/73

Int. Cl.² C07D 303/32

U.S. Cl. 260—348 R **1 Claim**

1. A compound selected from the following group:

a. 3,4-epoxy-5-isopropyl-nonane-2,8-dione, and

b. 6,7-epoxy-8-hydroxy-5-isopropyl-8-methyl-nonane-2-one.

3,946,051

AZIDOFORMATES AND THEIR USE

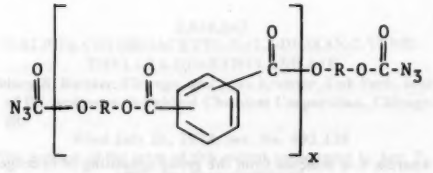
James N. Haynes, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 549,229, Feb. 12, 1975, Pat. No. 3,914,262, which is a division of Ser. No. 425,906, Dec. 18, 1973, Pat. No. 3,900,683, which is a division of Ser. No. 231,741, March 3, 1972, Pat. No. 3,814,657, which is a division of Ser. No. 93,399, Nov. 27, 1970, Pat. No. 3,686,231, and a continuation-in-part of Ser. No. 887,382, Dec. 22, 1969, abandoned. This application Apr. 30, 1975, Ser. No. 572,973

Int. Cl.² C07C 117/00

U.S. Cl. 260—349 **2 Claims**

1. A priming composition comprising (1) an omega-hydroxyalkyl phthalate azidoformate having the general formula



where R is an alkylene radical containing 2 to 10 carbon atoms and x is an integer from 1 to 10 and (2) a liquid medium.

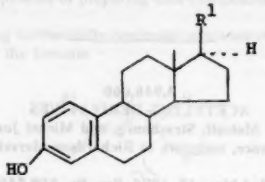
3,946,052

19-NORPREGNA- 1,3,5(10)-TRIEN-3-OL AND LOWERALKYL HOMOLOGS THEREOF HAVING POSTCOITAL ANTIFERTILITY ACTIVITY

David F. Crowe; Richard H. Peters, both of San Jose; Masato Tanabe, Palo Alto, and George Detre, San Jose, all of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed June 16, 1975, Ser. No. 587,256
Int. Cl.² C07J 1/00
U.S. Cl. 260—397.5 6 Claims

1. A compound having the structure



wherein R^1 represents a straight or branched loweralkyl group of from 2 to 7 carbon atoms.

3,946,053

HYDROCARBYL HYDROGEN PHOSPHATE SALTS OF AMINO-AMIDES

Franklin H. Robinson, N. Brunswick; Marvin S. Rakow, E. Brunswick, and Ernest Jamieson, Highland Park, all of N.J., assignors to Cities Service Oil Company, Tulsa, Okla.

Filed Sept. 30, 1970, Ser. No. 77,040
Int. Cl.² 260 309.6; C11C 3/00
U.S. Cl. 260—404.5 8 Claims

1. A composition consisting essentially of a hydrocarbyl hydrogen phosphate salt of a compound having the formula

wherein m is at least 1 and the sum of n plus m is from 2 to about 6, R is a multivalent hydrocarbon group of about 2 to about 52 carbons, R′ is a hydrocarbylene group of about 2 to about 12 carbons, R″ is selected from the group consisting of hydrogen and hydrocarbyl groups of about 1 to about 30 carbons, R‴ is a hydrocarbyl group of about 2 to about 12 carbons, and at least about 10% of the amino groups contained therein are converted to the hydrocarbyl hydrogen phosphate salt wherein each hydrocarbyl group of the phosphate molecule contains from 1 to about 15 carbon atoms.

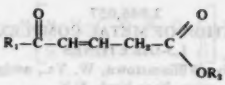
3,946,054

KETO-ESTER COMPOSITION

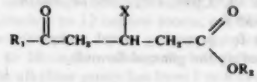
Erich Manfred Klaiber, Neptune, and Alan Owen Pittet, Atlantic Highlands, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 471,756, May 20, 1974, Pat. No. 3,873,574. This application Dec. 30, 1974, Ser. No. 537,591
Int. Cl.² C09F 7/00
U.S. Cl. 260—408 8 Claims

1. A mixture consisting essentially of of a first keto-ester having the formula:



and a second keto-ester having the formula:



wherein R_1 is C_1–C_{10} alkyl, R_2 is lower alkyl and X is chloro or bromo.

3,946,055

METHOD OF MANUFACTURING CARBOXYLIC ACID OR ESTER THEREOF

Hiroshi Isa, Funabashi; Takeo Inagaki, Yachiyo; Yasuhiro Kiyonaga, Musashino, and Masuzo Nagayama, Tokyo, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Sept. 30, 1974, Ser. No. 510,732
Claims priority, application Japan, Oct. 6, 1973, 48-112719
Int. Cl.² C11C 3/02, 1/00
U.S. Cl. 260—410.9 R 6 Claims

1. In a process for preparing carboxylic acids or esters by reacting olefin having at least 3 carbon atoms with carbon monoxide and either an alcohol or water, in the presence of cobalt compound and pyridine or a derivative of pyridine, the improvement which comprises the steps of: in a catalyst preparation vessel separate from the reaction vessel, heating materials consisting essentially of cobalt compound and pyridine compound selected from the group consisting of pyridine and mono-, di- and tri-alkyl substituted pyridines, wherein said alkyl has one to three carbon atoms, at a temperature in the range of 100° to 180°C, under a carbon monoxide pressure in the range of 20 to 200 kg/cm², for a time period of at least about 0.5 hours, effective to prepare a stable complex of said cobalt compound and said pyridine compound as an active catalyst; transferring said active catalyst from said catalyst preparation vessel and adding it to the reaction vessel containing said olefin and either said alcohol or water, as the sole supply of cobalt to said reaction vessel; and then reacting said olefin, either said alcohol or water, and carbon monoxide, in the presence of said active catalyst, until said carboxylic acid or ester is formed.

3,946,056

METHOD FOR PRODUCING STANNIC TERTIARY ALKOXIDE

Ian M. Thomas, Temperance, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed July 26, 1974, Ser. No. 492,351
Int. Cl.² C07F 7/22
U.S. Cl. 260—429.7 21 Claims

1. An anhydrous process for producing a compound of the formula $Sn(OR)_4$, wherein R is a tertiary alkyl group containing from 4 to 8 carbon atoms, which comprises: reacting a tertiary alkyl alcohol, wherein the alkyl group contains from 4 to 8 carbon atoms, with a stannic tetrahalide-alkylamine reaction product in the presence of an inert anhydrous organic diluent so as to form a dispersion of a solid amine hydrohalide in a solution containing said compound, said alkylamine being a secondary or tertiary alkylamine wherein each alkyl group thereof contains up to 10 carbon atoms; and isolating said compound from said dispersion.

3,946,057
PREPARATION OF METAL COMPLEXES OF 1,3-DIKETONES

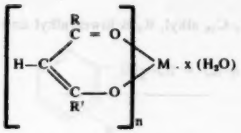
James Dale Reedy, Williamstown, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 250,046, May 3, 1972, abandoned. This application Feb. 7, 1974, Ser. No. 440,514

Int. Cl.[2] C07C *49/12*, *49/14*, *49/16*

U.S. Cl. 260—439 R **12 Claims**

1. A process for preparing metal complexes of organic 1,3-diketones having the general formula



wherein R and R′ are each individually monovalent organic radicals selected from the group consisting of alkyl, aryl, aralkyl, alkaryl, cycloalkyl, alkoxy, haloalkyl, and haloaryl radicals having from 1 to 12 carbon atoms; M is a metal cation selected from the group consisting of copper, zinc, mercury, lanthanum, cerium, praseodymium, neodymium, samarium, zirconium, chromium, uranium, manganese, iron, cobalt, nickel, platinum, palladium, cadmium, scandium, thorium, vanadium, ytturium, europium, gadolinium, hafnium, and plutonium, *n* is an integer which corresponds to the electrovalence of M and *x* has a value of O or a positive integer, which comprises reacting in the presence of an alkylene oxide and an inert organic polar solvent, a metal halide having the formula $M(X)_n.y(H_2O)$ wherein M and *n* are the same as defined above, X is halogen and *y* has a value of O or a positive integer, and an organic 1,3-diketone having the formula $RCOCH_2COR'$ wherein R and R′ are the same as defined above.

3,946,058
PROCESS FOR RECOVERING OF DIALKYLALUMINUM HALIDE FROM MIXTURES CONTAINING SOLUBLE ZINC

Dennis B. Malpass; George Charles Heilig, both of La Porte, and Thomas C. Foley, Pasadena, all of Tex., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Filed June 17, 1974, Ser. No. 479,693

Int. Cl.[2] C07F *5/06*

U.S. Cl. 260—448 A **7 Claims**

1. A process for the recovery of dialkylaluminum halides having from 1 to 6 carbon atoms from a mixture of the alkylaluminum halide and soluble zinc-containing compounds which comprises heating the mixture in an inert atmosphere at a temperature of about 150°–240°C. for a period of time sufficient to reduce the concentration to 200 ppm or lower zinc, and subsequently distilling the alkylaluminum halide from the mixture in an inert atmosphere.

3,946,059
METHOD OF PREPARING ALKYLALKOXYSILANES CONTAINING POLYSULFIDE BRIDGES

Paul Janssen, Bensberg-Refrath, and Klaus-Dieter Steffen, Troisdorf-Oberlar, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Dec. 3, 1974, Ser. No. 529,202

Claims prior y, application Germany, Dec. 5, 1973, 2360471

Int. Cl.[2] C07F *7/04*, *7/08*, *7/18*

U.S. Cl. 260—448.2 E **10 Claims**

1. A process for preparing an alkylalkoxysilane containing a polysulfide bridge having the formula:

$$(RO)_{3-m}R_mSi-Z-S_{x+2}-Z-SiR_m(OR)_{3-m}$$

wherein each R represents an identical or different linear or branched alkyl radical having 1 to 6 carbon atoms or phenyl, Z represents a linear or branched alkylene radical having 1 to 8 carbon atoms, *m* is 0 to 3, *x* is 1 to 4, which comprises contacting a bis-alkyl-alkoxysilyl-disulfide of the formula:

$$(RO)_{3-m}R_mSi-Z-S-S-Z-SiR_m(OR)_{3-m}$$

wherein R, Z and *m* have the previously assigned significance, with the sulfur at a temperature between 100° and 200°C.

3,946,060
ACETYLENE DERIVATIVES

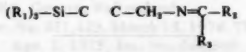
Brian Walter Metcalf, Strasbourg, and Michel Jung, Illkirch, both of France, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Mar. 18, 1975, Ser. No. 559,545

Int. Cl.[2] C07F *7/10*

U.S. Cl. 260—448.2 N **2 Claims**

1. A compound selected from a base of the formula:



wherein R_1 is selected from a lower alkyl group having from 1 to 4 carbon atoms; R_2 is selected from hydrogen and phenyl; R_3 is selected from phenyl and trialkylmethyl with the proviso that when R_3 is trialkylmethyl, R_2 is hydrogen; and acid addition salts thereof.

3,946,061
ORGANO-SILICA POLYMERS

Stanley J. Buckman, Memphis, Tenn.; Rudolf F. Lang, Ghent, Belgium, and Michael L. Mishler, Memphis, Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

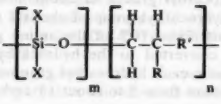
Continuation-in-part of Ser. No. 794,349, Jan. 27, 1969, Pat. No. 3,592,834. This application Feb. 17, 1971, Ser. No. 116,286

The portion of the term of this patent subsequent to July 13, 1988, has been disclaimed.

Int. Cl. C07F *7/18*

U.S. Cl. 260—448.8 R **2 Claims**

1. A method of preparing organo-silica polymers having the formula:



wherein *m* and *n* are integers independently representing the number of units; R represents —H, —CN, $-CONH_2$, $-CONH_3^+$, —COOH, $-COO^-$, —COOM, or —COOR″; R′ represents —NH, —NR″, or $-NR''\ H-^+$; and whenever R′ contains nitrogen, R is hydrogen; R″ represents an alkyl or aryl radical: M represents an alkali metal; M represents an alkali metal; X represents an —OH, $-O^-$, or —OM; which comprises reacting a polymeric silica compound selected from alkali metal silcaies or colloidal silica containing at least one of the bonds Si—OH or Si—O with an organic compound selected from the group consisting of organic comopomers and organic prepolymers characterized in that said organic compound contains an aziridine ring or a halogen and also contains an activating group selected from the group consisting of carboxyl, nitrile, and amide.

3,946,062

PREPARATION OF 2-CHLOROCYCLOALKYLTHIO UREA COMPOUNDS

James D. Cleveland, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 250,895, May 8, 1972, Pat. No. 3,857,883. This application Sept. 27, 1974, Ser. No. 509,753

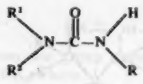
The portion of the term of this patent subsequent to Dec. 24, 1991, has been disclaimed.

Int. Cl.² C07C *155/02*

U.S. Cl. 260—453 R 11 Claims

1. In the process of preparing urea compounds which comprises:

1. reacting substantially equimolar amounts of a urea reactant of the formula



wherein R, R^1 and R^2 are hydrogen, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 10 carbon atoms, carbocylic aryl of 6 to 12 carbon atoms substituted with up to a 4 fluoro, chloro, bromo, trifluoromethyl, trichloromethyl, nitro or alkoxy of 1 to 4 carbon atoms, and sulfur dichloride in the presence of an acid acceptor, and

2. adding the resulting N-chlorothio urea product to a cycloalkene of 4 to 10 carbon atoms in the liquid phase in an inert diluent,

the improvement which comprises maintaining during step (1) the mols of uncomplexed acceptor to the total mols of urea reactant and N-chlorothio urea product at a ratio of less than 0.2:1 by the controlled addition of the acceptor to a mixture of the urea reactant and sulfur dichloride.

3,946,063

REAGENT FOR ELECTRONCAPTURE DETECTION AND TERTIARY AMINES

Jorgen Vessman, Skarholmen; Carl Magnus Svahn, Sollentuna, and Per Hartvig, Stockholm, all of Sweden, assignors to Pierce Chemical Company, Rockford, Ill.

Filed Oct. 7, 1974, Ser. No. 512,687

Claims priority, application Sweden, Mar. 28, 1974, 7404156

Int. Cl.² C07C *69/96*

U.S. Cl. 260—463 1 Claim

1. The compound 2,3,4,5,6-pentafluorobenzyl chloroformate.

3,946,064

HYDRAZODICARBOXYLATES AND USE THEREOF AS BLOWING AGENTS

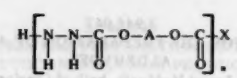
Byron A. Hunter, Woodbridge, and Gerald J. Hollmann, Naugatuck, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 456,994, April 1, 1974, Pat. No. 3,894,974, which is a continuation-in-part of Ser. No. 354,818, April 26, 1973, abandoned. This application Apr. 9, 1975, Ser. No. 566,478

Int. Cl.² C07C *69/96*

U.S. Cl. 260—463 3 Claims

1. An oligomer of the formula



wherein n is a number in the range of from 1 to 100, X is chlorine, and A is a divalent radical selected from the group consisting of alkylene radicals having 2 to 6 carbon atoms, arylene radicals 6 to 12 carbon atoms, oxydialkylene radicals having 4 to 12 carbon atoms, and oxydiarylene radicals containing 12 to 20 carbon atoms, alkylenediphenylene radicals in which the alkylene group has from 1 to 6 carbon atoms, and alkylidenediphenylene radicals in which the alkylidene group has from 1 to 6 carbon atoms.

3,946,065

PRODUCTION OF CYCLOPENTANE DERIVATIVES

Masanao Matsui, Tokyo; Junki Katsube, Tononaka; Hiromi Shimomura, and Eichi Murayama, both of Takarazuka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

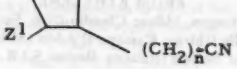
Filed Apr. 30, 1971, Ser. No. 139,239

Claims priority, application Japan, Apr. 30, 1970, 45-37358; Sept. 26, 1970, 45-84293; Sept. 26, 1970, 45-84294; Sept. 26, 2970, 45-84295; Sept. 25, 1970, 45-84296; Oct. 30, 1970, 45-96302

Int. Cl.² C07C *120/00*, *121/46*

U.S. Cl. 260—464 15 Claims

1. Cyclopentane derivatives of the formula



wherein n is an integer of from 1 to 7 and Z^1 is selected from the group consisting of formyl, carboxyl, hydroxymethyl, and acetyl.

3,946,066

DIMERISATION PROCESS AND CATALYST

Peter Frank Todd, Stockton, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 29, 1974, Ser. No. 501,605

Claims priority, application United Kingdom, Oct. 1, 1973, 45686/73

Int. Cl.² C07C *120/00*

U.S. Cl. 260—465.8 D 3 Claims

1. A process for the conversion of acrylonitrile to a product containing more than 50% by weight of adiponitrile, 1,4-dicyano-butenes, or mixtures thereof, which comprises heating acrylonitrile in the liquid phase at a temperature of 50° to 200°C and a pressure of up to 250 atmospheres in the presence of hydrogen or a compound capable of supplying hydrogen under reation conditions and a catalyst consisting essentially of a ruthenium compound co-precipitated with an aluminum oxide or hydroxide in which the proportion of ruthenium to aluminum is in the range 1:40 to 10:1 by weight, said catalyst being obtained by adding a base less strong than alkali metal hydroxide to an aqueous solution to form an alkaline solution containing a water-soluble ruthenium compound and a water-soluble aluminum compound to effect co-precipitation and separating the co-precipitate at a temperature below about 200°C.

3,946,067

PROCESS FOR THE PREPARATION OF AROMATIC ALDEHYDES

Jack Kwiatek; Jawad H. Murib, both of Cincinnati, Ohio, and Charles K. Brush, Minneapolis, Minn., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 284,524, Aug. 29, 1972, abandoned.
This application Jan. 28, 1975, Ser. No. 544,613
Int. Cl.² C07C 67/30, 45/02
U.S. Cl. 260—476 R 15 Claims

1. A process for the preparation of aromatic aldehydes which consists essentially of oxidizing in the vapor phase an organic compound selected from the group consisting of toluene, xylene, p-cymene, mesitylene, durene, pentamethylbenzene, hexamethylbenzene, methylnaphthalene, p-phenyltoluene, 2,2-di(p-tolyl) propane, methoxytoluene, p-phenoxytoluene, ditolyl ether, 2,5-dimethoxytoluene, methyl p-toluate, p-methyl benzoic acid, p-methylbenzophenone, and 4-methylphthalic anhydride, with molecular oxygen at a temperature of from about 100°–250°C. in the presence of a supported catalyst composition, said catalyst composition being supported on an inert carrier material having about 1–50 percent by weight of phosphoric acid impregnated therein and about 0.1–5 percent by weight of palladium in the form of palladium metal or palladium metal admixed, alloyed or in solid solution with about 1–200 percent based on the palladium of a Group IB or VIII metal selected from the group consisting of gold, platinum, silver, rhodium, ruthenium and iridium deposited thereon.

3,946,068

PROCESS FOR THE PRODUCTION OF VINYL ACETATE FROM ETHYLENE

Benedetto Calcagno, Milan; Claudio Divo, Saronno (Varese), and Marcello Ghirga, Cassano D'Adda (Milan), all of Italy, assignors to Societa Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Oct. 1, 1969, Ser. No. 862,955
Claims priority, application Italy, Oct. 12, 1968, 22414/68
Int. Cl.² C07C 67/04
U.S. Cl. 260—497 A 7 Claims

1. In a process for the production of vinyl acetate by feeding ethylene and a member selected from the group consisting of oxygen and oxygen-containing gases into a catalytic mixture consisting of palladium and copper halogenides and an acetate selected from the group consisting of alkali metal and alkaline earth metal acetates in acetic acid, under conditions of high temperature and pressure, wherein said catalytic mixture is recovered and regenerated, the improvement which comprises:

a. removing the catalytic mixture from the reaction vessel in which the vinyl acetate is being produced;

b. bringing said mixture into contact with an element having an electrochemical potential algebraically lower than the electrochemical potentials of copper and palladium, so as to separate the palladium and copper in their elementary form;

c. converting the metallic palladium and copper so recovered to the corresponding chloride salt, by placing the metallic palladium and copper in suspension in a dilute aqueous solution of hydrochloric acid and bubbling therethrough, a member selected from the group consisting of chlorine gas, air, and oxygen; and

d. returning the metallic palladium and copper chloride salts to the reaction vessel in which the vinyl acetate is being produced,

said exhausted catalytic mixture being set at a temperature near room temperature and further being allowed to freely rise by the effect of the heat evolved from galvanic displacement up to the boiling point of the mixture.

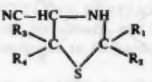
3,946,069

PROCESS OF MAKING PENICILLAMINE

Friedrich Asinger, Rott; Wolf Dieter Pfeifer; Heribert Offermanns, both of Grossauheim; Paul Scherberich, Neu Isenburg, and Gerd Schreyer, Grossauheim, all of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed Dec. 20, 1972, Ser. No. 317,403
Claims priority, application Germany, Dec. 22, 1971, 2163810
Int. Cl.² C07C 148/00, 149/243, 149/26
U.S. Cl. 260—534 S 9 Claims

1. A process for the production of penicillamine hydrochloride or a derivative thereof which comprises heating in two stages in the presence of at least a stoichiometric amount of water and hydrochloric acid a thiazolidine-4-carbonitrile having the formula



in which formula

R_1 and R_2 are each an alkyl radical having at least 1 and at most 6 carbon atoms or which together form a closed ring, or an alkenyl radical having at least 2 and at most 4 carbon atoms,

R_3 and R_4 are each an alkyl radical having at least 1 and at most 6 carbon atoms, or which together form a closed ring, the heating in the first stage being conducted at a temperature between 20° and 80°C in hydrochloric acid having a concentration of at least 30% and at most 80% by weight of hydrogen chloride, and the heating in the second stage being conducted at a temperature between 80° and 110°C in hydrochloric acid having a concentration of at least 10% and at most 30% by weight of hydrogen chloride.

3,946,070

PROCESS FOR THE PREPARATION OF SATURATED LONG-CHAIN DICARBOXYLIC ACIDS

Lucien Billet, Lyon, and Guy Lartigau, Tassin-La-Demi-Lune, both of France, assignors to Rhone-Poulenc Textile, Paris, France

Filed July 1, 1974, Ser. No. 484,925
Claims priority, application France, July 3, 1973, 73.24435
Int. Cl.² C07C 51/16
U.S. Cl. 260—537 P 26 Claims

1. In a process for the preparation of a linear or branched alkane-dicarboxylic acid possessing at least 8 chain carbon atoms separating the two hydroxycarbonyl groups, which comprises subjecting a cycloalkanone peroxide to double deperoxidation, by means of ferrous ions, the improvement wherein the double deperoxidation by means of ferrous ions is carried out in the presence of hydrogen and a metal hydrogenation catalyst selected from the group consisting of platinum, palladium and nickel.

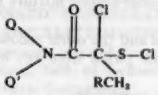
3,946,071

SUBSTITUTED ALPHA-CHLORO-METHANE-SULFENYL CHLORIDES

Wendell Gary Phillips, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 139,977, May 3, 1971, Pat. No. 3,803,224.
This application Dec. 7, 1973, Ser. No. 422,638
Int. Cl.² C07C 145/00
U.S. Cl. 260—543 H 3 Claims

1. A compound having the formula



wherein

R is hydrogen or alkyl of 1 through 3 carbons, Q and Q′ are independently selected from the group consisting of hydrogen, $C_{1\text{-}5}$ alkyl, lower alkoxyalkyl and the group

wherein

R_1 is selected from the group consisting of lower alkyl, halogen and $-CX_3$ where

X is halogen and n is an integer from 0—3 inclusive or Q and Q′ may be combined to form an alkylene group having from 4 to 8 carbon atoms.

3,946,072

METHOD FOR REACTING ORGANIC HALIDES

Michael F. Farona, Cuyahoga Falls, and James F. White, Akron, both of Ohio, assignors to The University of Akron, Akron, Ohio

Division of Ser. No. 339,637, March 9, 1973, Pat. No. 3,832,403, which is a continuation-in-part of Ser. No. 119,908, March 1, 1971, abandoned. This application Apr. 10, 1974, Ser. No. 459,485

Int. Cl.² C07C *143/70*

U.S. Cl. 260—543 R **8 Claims**

1. The process of reacting an organic halide with an aromatic substrate to form an aromatic product comprising the steps of: charging a reaction vessel with a metallic hexacarbonyl compound having the general formula $M(CO)_6$ wherein M is selected from the group consisting of Cr, Mo and W, adding an aromatic substrate having the general formula

wherein R′ is selected from the group consisting of hydrogen and sulfonyl chloride with the proviso that at least one of said R′ is other than hydrogen, reacting said metallic hexacarbonyl compound with part of said aromatic substrate to yield an arene metal tricarbonyl catalyst having the general formula

charging the reaction vessel with an organic halide having the general formula RX wherein R is an alkyl group having from 1 to about 20 carbon atoms, and X is selected from the group consisting of bromine, chloride and fluorine, heating said reaction vessel from ambient temperatures to a temperature sufficient to cause said catalyst to remove the halide from said organic halide with generation of a carbonium ion from said organic halide so that said carbonium ion will attack the remaining part of said aromatic substrate to yield the aromatic product.

3,946,073

PROCESS FOR PREPARATION OF UREA AUTOCONDENSATION PRODUCT

William H. Cook, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 427,594, Dec. 26, 1973, abandoned, which is a continuation of Ser. No. 865,209, Oct. 9, 1969, abandoned. This application Dec. 9, 1974, Ser. No. 530,337

Int. Cl.² C07C *127/24*

U.S. Cl. 260—553 B **4 Claims**

1. A process for preparing biuret which comprises

a. introducing a urea feedstock, said feedstock being urea or a mixture of urea, biuret and other urea autocondensation products, into a heated falling film reactor,

b. passing said urea feedstock through said heated reactor as a thin film and at a flow rate of from about 180 to about 600 pounds of actual urea feedstock/hour/foot of reactor cylinder periphery (lb/hr/ft) which provides a biuret pyrolysis product exiting from said reactor at a temperature of from about 180°C. to about 240°C.,

c. removing evolved ammonia from the falling film reactor system as it is formed, and

d. recovering the biuret product.

3,946,074

PLANT GROWTH REGULATORY AGENTS AND PROCESS

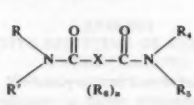
Walter W. Abramitis, Downers Grove, Ill., assignor to Akzona Incorporated, Asheville, N.C.

Continuation-in-part of Ser. No. 78,240, Oct. 5, 1970, Pat. No. 3,857,879, which is a continuation-in-part of Ser. No. 687,438, Dec. 4, 1967, abandoned. This application Oct. 21, 1974, Ser. No. 516,715

Int. Cl.² C07C *103/14*

U.S. Cl. 260—561 K **13 Claims**

1. A compound of the formula:



wherein X is saturated alkylene having from 1 to 6 carbon atoms; R is selected from the group consisting of hydrogen and alkyl having 1 to 18 carbon atoms; R′ is alkyl having 1 to 18 carbon atoms; R_4 is selected from the group consisting of hydrogen and an aliphatic hydrocarbon group having 1 to 18 carbon atoms; R_5 is an aliphatic hydrocarbon group having 1 to 22 carbon atoms; R_6 is selected from the group consisting of halogen, hydroxy, carboxy, carboxamide, alkyl having 1 to 20 carbon atoms, and Δ^3-alkenyl having 2 to 18 carbon atoms; and n is an integer from 1 to 2.

3,946,075

2-AMINOMETHYLENE-1-PHENYL-1,3-BUTANEDIONE

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Nov. 1, 1974, Ser. No. 520,023

Int. Cl.² C07C *97/10*

U.S. Cl. 260—570.5 C **1 Claim**

1. The compound 2-aminomethylene-1-phenyl-1,3-butanedione.

3,946,076

CONTINUOUS PROCESS FOR RECOVERY OF CYCLOHEXANONE

Mathijs M. F. Paasen, Oirsbeek, and Harrie H. J. Meijerink, Geleen, both of Netherlands, assignors to Stamicarbon, N.V., Geleen, Netherlands

Filed Oct. 13, 1972, Ser. No. 297,448

Claims priority, application Netherlands, Oct. 14, 1971, 7114111

Int. Cl.[2] C07C *27/12, 29/00, 45/02*

U.S. Cl. 260—586 P **2 Claims**

1. In a process for the oxidation of cyclohexane to cyclohexanone comprising:

a. reacting cyclohexane and oxygen at a temperature of 75°–200°C and a pressure of 1–50 atmospheres to produce a reaction product comprising cyclohexanol and cyclohexanone;

b. removing acids from the reaction product;

c. recovering nonconverted cyclohexane from the reaction product by distillation and returning it to the oxidization zone of step (a);

d. saponifying the remaining reaction product to increase the yield of cyclohexanol;

e. thereafter first distilling off and discarding a light or top fraction from the reaction product, which light fraction contains substantially all products with boil-point under the prevalent distillation conditions below that of cyclohexanone;

f. further distilling the reaction product to recover cyclohexanone as a second light fraction and to produce a bottom product containing cyclohexanol;

g. dehydrogenating cyclohexanol from the bottom product of step (f) to produce a conversion product containing cyclohexanone and cyclohexanol and introducing this conversion product back into the process at step (e);

the improvement comprising:

removing substantially all of the water from the conversion product of step (g) by azeotropic distillation in the presence of cyclohexane as a separating agent, before directing this conversion product to distillation step (e).

3,946,077

PROCESS FOR OXIDATING HYDROCARBONS

Reinhard Thiel; Heinz Jorg Rosenbaum, and Karl Heinz Heller, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 4, 1974, Ser. No. 439,689

Claims priority, application Germany, Mar. 28, 1973, 2315350

Int. Cl.[2] C07C *27/12, 27/16, 29/00, 45/02*

U.S. Cl. 260—586 AB **15 Claims**

1. In a process for the oxidation of hydrocarbons to form alcohol-ketone mixtures which comprises:

a. reacting a hydrocarbon having from 4 to 20 carbon atoms with a gas containing molecular oxygen in the presence of an oxidation catalyst;

b. washing the reaction mixture from (a) in an intermediate hydrolysis stage with water and separating said catalyst, leaving a washed organic reaction mixture;

c. saponifying the organic reaction mixture from (b) with an aqueous alkaline solution and separating the organic phase from the aqueous alkaline phase that forms;

d. recovering said alcohol-ketone mixture from the organic phase from (c);

e. recovering alcohols and the other secondary products in the aqueous alkaline phase from (c) by distallation or stripping;

the improvement which comprises:

f. subjecting the aqueous alkaline phase from (e) which contains organic impurities to a liquid phase oxidation with a gas containing molecular oxygen in at least a stoichiometric quantity sufficient to completely burn the organic impurities and to form carbon dioxide water and an alkali carbonate/bicarbonate solution, said oxidation taking place in a reaction zone heated to at least 200°C and under a pressure sufficient to keep at least some of the water in the liquid phase; and

g. returning said alkali carbonate/bicarbonate solution to saponification step (c).

6. In a process for the oxidation of hydrocarbons to form alcohol-ketone mixtures which comprises:

a. reacting a hydrocarbon having from 4 to 20 carbon atoms with a gas containing molecular oxygen in the presence of a boron compound;

b. washing the reaction mixture from (a) in an intermediate hydrolysis stage with water and separating said boron compound, leaving a washed organic reaction mixture;

c. saponifying the organic reaction mixture from (b) with an aqueous alkaline solution and separating the organic phase from the aqueous alkaline phase that forms;

d. recovering said alcohol-ketone mixture from the organic phase from (c);

e. recovering alcohols and the other secondary products in the aqueous alkaline phase from (c) by distillation or stripping;

the improvement which comprises:

f. subjecting the aqueous alkaline phase from (e) which contains organic impurities to a liquid phase oxidation with a gas containing molecular oxygen in at least a stoichiometric quantity sufficient to completely burn the organic impurities and to form carbon dioxide water and an alkali carbonate/bicarbonate solution, said oxidation taking place in a reaction zone heated to at least 200°C and under a pressure sufficient to keep at least some of the water in the liquid phase; and

g. returning said alkali carbonate/bicarbonate solution t saponification step (c).

11. In a process for the oxidation of hydrocarbons to form alcohol-ketone mixtures which comprises:

a. reacting a hydrocarbon having from 4 to 20 carbon atoms with a gas containing molecular oxygen in the presence of an oxidation catalyst and a boron compound;

b. washing the reaction mixture from (a) in an intermediate hydrolysis stage with water and separating said catalyst and boron compound, leaving a washed organic reaction mixture;

c. saponifying the organic reaction mixture from (b) with an aqueous alkaline solution and separating the organic phase from the aqueous alkaline phase that forms;

d. recovering said alcohol-ketone mixture from the organic phase from (c);

e. recovering alcohols and the other secondary products in the aqueous alkaline phase from (c) by distillation or stripping;

the improvement which comprises:

f. subjecting the aqueous alkaline phase from (e) which contains organic impurities to a liquid phase oxidation with a gas containing molecular oxygen in at least a stoichiometric quantity sufficient to completely burn the organic impurities and to form carbon dioxide water and an alkali carbonate/bicarbonate solution, said oxidation taking place in a reaction zone heated to at least 200°C and under a pressure sufficient to keep at least some of the water in the liquid phase; and

g. returning said alkali carbonate/bicarbonate solution to saponification step (c).

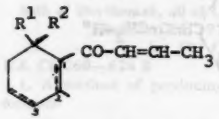
3,946,078

CYCLOALIPHATIC UNSATURATED KETONES AS ODOUR- AND TASTE-MODIFYING AGENTS

Valentin Rautenstrauch, Grand-Lancy, Geneva, and Ferdinand Naf, Geneva, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

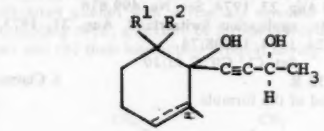
Division of Ser. No. 284,467, Aug. 29, 1972, Pat. No. 3,852,355. This application Apr. 29, 1974, Ser. No. 465,082
Claims priority, application Switzerland, Aug. 31, 1971, 12755/71
Int. Cl.² C07C 45/00
U.S. Cl. 260—586 R 4 Claims

1. Process for the preparation of compounds of the formula



I

containing an isolated double bond in position 1 or two conjugated double bonds in position 1 and 3, the double bonds being represented by the dotted lines, and wherein the substituents R^1 and R^2 may be the same or different and each represents a hydrogen atom or a lower alkyl radical containing from 1 to 6 carbon atoms, which comprises treating a diol having the formula



comprising a saturated or mono-unsaturated six membered ring, the double bond being indicated by the dotted line and wherein R^1 and R^2 have the meaning indicated above, with phosphoric acid, sulphuric acid, trifluoroacetic acid, p-toluene sulphonic acid, acid diatomaceous earths or an acidic cation exchange resin.

3,946,079

METHOD OF CONDENSING KETONES

Yukio Mizutani, Tokuyama; Yusuke Izumi, Yamaguchi, and Yoshiaki Watanabe, Hikari, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Japan

Continuation of Ser. No. 780,622, Dec. 3, 1968, abandoned. This application Jan. 7, 1971, Ser. No. 104,735
Claims priority, application Japan, June 24, 1966, 41-40653
Int. Cl.² C07C 45/00
U.S. Cl. 260—593 R 4 Claims

1. A process of producing unsaturated ketone condensation products which comprises condensing at a temperature of from 60° to 300°C., a ketone of 3–19 carbon atoms having the following formula

wherein R_1 is either alkyl, cycloalkyl, aryl, aralkyl, alkaryl or alkenyl, and R_2 and R_3, which may be the same or different are each hydrogen, alkyl, cycloalkyl, aryl, aralkyl, alkaryl or alkenyl,

said process being carried out in the presence of a catalyst consisting of at least one metal phosphate selected from the group consisting of titanium phosphate, zirconium phosphate, hafnium phosphate, and tin phosphate.

3,946,080

FLAVOURING AND PERFUMING INGREDIENTS

Edouard P. Demole, Coppet, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Division of Ser. No. 451,423, March 15, 1974. This application Apr. 2, 1975, Ser. No. 564,559
Claims priority, application Switzerland, Apr. 10, 1973, 5122/73; Apr. 12, 1973, 5274/73
Int. Cl.² C07C 49/12
U.S. Cl. 260—593 R 1 Claim

1. 5-isopropyl-nonane-2,8-dione.

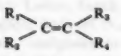
3,946,081

OXIDATIVE SPLITTING OF UNSATURATED HYDROCARBONS

Karl-Friedrich Wedemeyer, and Laszlo Imre, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 27, 1972, Ser. No. 318,961
Claims priority, application Germany, Jan. 13, 1972, 2201411
Int. Cl.² C07C 45/04
U.S. Cl. 260—597 R 15 Claims

1. In a process wherein an alkene hydrocarbon of the formula



wherein

R_1, R_2, R_3 and R_4 each independently is hydrogen, an aryl group optionally substituted by at least one lower C_1–C_4 alkyl radical,

a straight-chain or branched alkyl radical with up to 18 C atoms, optionally phenyl substituted when lower alkyl, or

the radicals R_1 and R_2 together, or R_3 and R_4 together, contain not more than 20 C atoms and each, independently of each other, form a carbocyclic ring, or

the radicals R_1 and R_3 together with the C atoms of the C—C double bond are a carbocyclic ring with up to 24 C atoms and R_2 and R_4 each independently is hydrogen or a lower alkyl radical,

is oxidatively split with both C atoms of the double bond being converted to aldehyde or ketone functions, the improvement which comprises contacting the hydrocarbon for a time sufficient to produce said aldehyde or ketone functions with a gas consisting essentially of oxygen at about 150° to 650°C in the presence of a catalyst consisting essentially of at least one oxide of a metal selected from the group consisting of vanadium, niobium, tantalum, chromium, molybdenum, tungsten, uranium, manganese, technetium and rehenium, oxygen being present in about 0.02 to 50 times the molar amount of the alkene.

3,946,082

PREPARATION OF ZEROVALENT PHOSPHINE SUBSTITUTED RHODIUM COMPOUNDS AND THEIR USE IN THE SELECTIVE CARBONYLATION OF OLEFINS

Gary B. McVicker, Westfield, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 237,891, March 24, 1972, abandoned. This application Feb. 6, 1974, Ser. No. 439,849

Int. Cl.² C07C *45/08*

U.S. Cl. 260—604 HF 6 Claims

1. A process for the production of normal aldehydes which comprises the step of contacting an alpha olefinic hydrocarbon having up to 20 carbon atoms at a temperature ranging from 50° to 175°C. and a pressure ranging from 10 to 1000 psi with carbon monoxide and hydrogen in the presence of a catalyst wherein the amount of catalyst ranges from 10^{-6} to 10^{-1} mols of rhodium per mol of alpha olefinic hydrocarbon and wherein said catalyst composition is characterized as one of the following zero-valent rhodium complexes:

$$[(L)(L')Rh^{\circ}]_2 \ , \ [L_2Rh^{\circ}]_2 \ , \ [L_2'Rh^{\circ}]_2 \ , \ [L''Rh^{\circ}]_2$$

where L is a monodentate phosphine ligand, L′ is a bidentate phosphine ligand and L″ is a tri or quadra-dentate phosphine ligand, wherein L, L′ and L″ is the same or different and each is one selected from the group consisting of:

1. R_3P, $R_2R'P$, $(RR'R'')P$

2. $R_3P(CR_2')_xP\,R_2'$

3. $R_2P(CR_2')_xP(CR_2')_xPR_2'$ (R″ on the P bearing $(CR_2')_x$)

4. $R_2P(CR_2')_xP(CR_2')_xP(CR_2')_xPR_2'$ (R″ on each P bearing $(CR_2')_x$)

5. $R''P[(CR_2')_xPR_2'']_2$

6. $P[(CR_2')_xPR_2]_3$

wherein R, R′ and R″ can be the same or different and each is selected from the group consisting of hydrogen, F, Cl, Br and I, C_1 to C_4 alkyl, to C_4 alkoxy, C_3 to C_8 cycloalkyl, C_3 to C_8 cycloalkyl, phenyl, phenyl substituted with F, Cl, Br and I, phenyl substituted with C_1 to C_4 alkyl, phenyl substituted with C_3 to C_8 cycloalkyl, phenyl substituted with C_1 to C_4 alkoxy, oxyphenyl, oxyphenyl substituted with C_1 to 132 20C, alkyl, oxyphenyl substituted with C_3 to C_8 cycloalkyl, oxyphenyl substituted with F, Cl, Br and I, oxyphenyl substituted with C_1 to C_8 cycloalkoxy; can be the same or different and each is selected from the and x is an integer ranging from 1 to 5.

3,946,083

HALOGENATED AROMATIC ETHERS

Yvon Delaunois, Tessenderlo; Pierre Hestermans, Brussels; Georges Leroy, Brussels; Fernand Peerts, Heverlee, and Claude Wilante, Brussels, all of Belgium, assignors to Tessenderlo Chemie S.A., Tessenderlo, Belgium

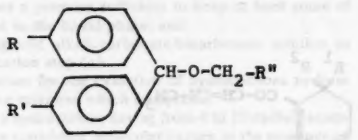
Filed Apr. 7, 1975, Ser. No. 565,713

Claims priority, application France, Apr. 10, 1974, 74.12537

Int. Cl.² C07C *43/20*

U.S. Cl. 260—611 A 16 Claims

1. An ether of the formula:



wherein R″ is an alkyl of not more than 6 carbon atoms and has at least 3 fluorine atoms bonded thereto, R and R′ being identical or different represent H or Cl.

3,946,084

PHENOXYPHENYL 1-ALKOXY-3-METHYLBUTENYL ETHERS

Friedrich Karrer, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

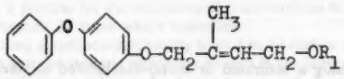
Filed Aug. 23, 1974, Ser. No. 499,816

Claims priority, application Switzerland, Aug. 31, 1973, 12534/73; July 24, 1974, 10208/74

Int. Cl.² C07C *43/20*

U.S. Cl. 260—613 R 5 Claims

1. A compound of the formula



wherein

R_1 is C_1–C_8-alkyl, C_3–C_5-alkenyl or C_3-alkynyl.

3,946,085

ACETALS DERIVED FROM NEGATIVELY SUBSTITUTED ALDEHYDES AND POLYNITRO- OR HALONITROETHANOLS

Horst G. Adolph, Beltsville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 17, 1974, Ser. No. 461,554

Int. Cl.² C07C *43/30*

U.S. Cl. 260—615 A 4 Claims

1. A compound of the formula $(RO)_2CHCH(OR)_2$ wherein R is selected from the group consisting of $-CH_2CYZ(NO_2)$ and $-CH_2C(NO_2)_2CH_3$, wherein Y and Z vary independently and are selected from the group consisting of Cl, F, and NO_2.

3,946,086

METHOD OF PRODUCING 2,6-DIALKYL- AND 2,6-DIARALKYL-SUBSTITUTED DERIVATIVES OF P-CRESOL

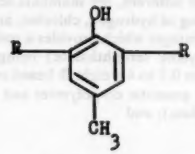
Felix Borisovich Gershanov, prospekt Lenina, 81, kv. 6; Alexandr Grigorievich Liakumovich, prospekt Lenina, 23, kv. 4; Jury Ivanovich Michurov, ulitsa Khudaiberdina, 125, kv. 36; Boris Izrailevich Pantukh, ulitsa Khudaiberdina, 130, kv. 115; Grigory Iosifovich Rutman, ulitsa Revoljutsionnaya, 7, kv. 6, all of Sterlitamak; Valerian Mikhailovich Sobolev, Naberezhnaya Maxima Gorkogo, 46/50, kv. 185, Moscow; Alexandr Afroimovich Grinberg, Nagatinskoe shosse, 21, kv. 60, Moscow; Yakov Abramovich Gurvich, Tsentr, Sretensky bulvar, 6, kv. 61, Moscow; Nina Vasilievna Zakharova, prospekt Lenina, 23, kv. 4, and Almira Mudarisovna Nafikova, ulitsa Elevatornava, 112, kv. 31, both of Sterlitamak, all of U.S.S.R.

Filed Oct. 28, 1970, Ser. No. 84,934

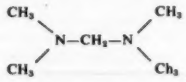
Int. Cl.[2] C07C *39/02*

U.S. Cl. 260—624 R **18 Claims**

1. A method of producing a 2,6-dialkyl-p-cresol of the formula

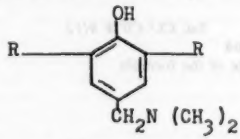


wherein R signifies an alkyl radical having from 4 to 12 carbon atoms comprising alkylating phenol with an olefin having from 4 to 12 carbon atoms at a temperature of 50°–150°C. in the presence of aluminum as a catalyst in an amount of 0.1–5% by weight of the phenol to form an alkylated phenol, treating said alkylated phenol with a reactant selected from the group consisting of (a) a mixture of formaldehyde and dimethylamine and (b) their interaction product having the formula



at a temperature of 20°–100°C. to form an intermediate product, N,N-dimethyl-3,5-dialkyl-4-hydroxy benzylamine, and subjecting said intermediate product to catalytic hydrogenolysis at 80°–200°C. using a molar ratio of hydrogen to said intermediate product of 1–5:1 and a space velocity of 0.1–2 hour^{-1} to form the 2,6-dialkyl-p-cresol.

11. A method of producing a 2,6-dialkyl-p-cresol which comprises subjecting a N,N-dimethyl-3,5-dialkyl-4-hydroxybenzylamine of the formula



wherein R signifies an alkyl radical having 4 to 12 carbon atoms to catalytic hydrogenolysis at 80°–200°C. using a molar ratio of hydrogen to said N,N-dimethyl-3,5-dialkyl-4-hydroxybenzylamine of 1–5:1 and a space velocity of 0.1–2 hour^{-1} to form the 2,6-dialkyl-p-cresol.

3,946,087

PROCESS FOR HYDROGENATING KETONES

Gerard Hillion, Franconville, and Christian Lassau, Villepreux, both of France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Paris, France

Filed Mar. 6, 1974, Ser. No. 448,483

Claims priority, application France, Mar. 12, 1973, 73.08775

Int. Cl.[2] C07C *29/00, 31/00, 31/02*

U.S. Cl. 260—631 H **11 Claims**

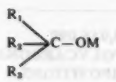
1. In a process for converting a ketone of the formula R — CO — R′ where R and R′ are monovalent hydrocarbon radicals or, when taken together, are a divalent hydrocarbon radical, to form the corresponding secondary alcohol, said process comprising reacting said ketone in the liquid phase with free hydrogen in the presence of a catalyst obtained by reacting a molar proportion of at least one compound (A) of a metal from one of the groups Ib, IIb, IV*a*, V*a*, VI*a*, VII*a* or VII of the periodic classification, with a 0.1–20 molar proportion of a metal reducing compound (B) selected from the group consisting of

a. a compound of the formula R-Li where R is a monovalent hydrocarbon radical,

b. a compound of the formula AlH_nX_{3-n} where n is zero provided all X are R groups, or 1, 2 or 3, X is R, OR, NR_2, NHR or SR or, provided n is 1, two R groups are linked to form an -A-Z-B- group where A and B are alkylene groups and Z is an oxygen or sulfur atom, an alkylene group, a NH group or N-hydrocarbyl group, and R is a monovalent hydrocarbon radical, and

c. a compound of the formula $M(AlH_mX'_{4-m})_p$ where m is an integer from 1 to 4, M is a mono- or di-valent metal selected from the metals of groups Ia and IIa, p is the valence of this metal and X′ is defined as X,

the improvement wherein said reacting of said ketone with hydrogen in the presence of said catalyst is conducted in the additional presence of, as part of the catalyst system, 0.1–10 molar proportion of at least one metal alcoholate of the formula



where M is an alkali metal and R_1, R_2 and R_3 are hydrogen atoms or monovalent hydrocarbon radicals or, when taken by pairs, form a hydrocarbon ring with the carbon atom linked to the —OM group, the hydrocarbon portion of said metal alcoholate being aromatic of not more than 13 carbon atoms, or alkyl or cycloalkyl of not more than 12 carbon atoms with the provision that said cycloalkyl contains at least 5 carbon atoms.

3,946,088

HYDROCARBON ISOMERIZATION PROCESS

Frederic Leder, South Orange; George M. Kramer, Berkeley Heights, both of N.J., and Herman J. Solomon, Milford, Conn., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Oct. 11, 1974, Ser. No. 514,002

Int. Cl.[2] C07C *5/28*

U.S. Cl. 260—683.75 **16 Claims**

1. An isomerization process which comprises: contacting in a reaction zone, in the presence of hydrogen, a hydrocarbon feed comprising a saturated aliphatic hydrocarbon, a hydrogen halide selected from the group consisting of hydrogen chloride, hydrogen bromide and mixtures thereof, said hydrocarbon feed and hydrogen halide being substantially in liquid phase, and a metal halide catalyst selected from the group consisting of aluminum chloride, aluminum bromide and mixtures thereof, at a temperature ranging from at least about 50°C. to the critical temperature of the mixture of said hydro-

carbon feed and said hydrogen halide, said critical temperature ranging up to about 150°C., the partial pressure of said hydrogen ranging from about 40 to about 1000 psia, the molar ratio of said hydrogen to said hydrocarbon feed ranging from 0.05 to 2.5 moles hydrogen per mole hydrocarbon feed, the partial pressure of the mixture of said hydrocarbon feed and said hydrogen halide being maintained at least equal to the critical pressure of the hydrocarbon feed and not greater than the critical pressure of said mixture of hydrocarbon feed and hydrogen halide, said partial pressure of the mixture of said hydrocarbon feed and said hydrogen halide ranging from about 250 to about 2500 psia, and wherein the molar ratio of said hydrogen halide to said hydrocarbon feed is at least 1:1 and the molar ratio of said hydrogen halide to said metal halide catalyst ranges from about 10:1 to about 40:1.

3,946,089
BLOCK COPOLYMER OF POLYAMIDE AND POLYETHER, AND ITS PREPARATION AND USE

Kaoru Furukawa; Chiaki Tsukamoto; Hiroshi Nagai; Koichi Matsunami, and Hikoichi Nagano, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Feb. 6, 1974, Ser. No. 439,987

Claims priority, application Japan, Feb. 6, 1973, 48-15318

Int. Cl.² C08L *77/00*

U.S. Cl. 260—857 PG **15 Claims**

1. A block copolymer of 99.8 to 90 % by weight of a polyamide segment and 0.2 to 10 % by weight of a polyether segment dispersed in an island state of not more than about 10 μ in particle size, the polyamide segment comprising at least one diamine component containing 100 to 50 mol % of m-xylylenediamine or its mixture with p-xylylenediamine and at least one dicarboxylic acid component containing 100 to 50 mol % of at least one aliphatic dicarboxylic acid having 6 to 12 carbon atoms, the polyether segment comprising at least one polyether having a molecular weight of 2,000 to 20,000 and an amino group or a carboxyl group at at least one terminal position thereof and the block copolymer having a scattering index of not less than 1.

3,946,090
FLAME-RESISTANT POLYCARBONATE MOLDING COMPOSITIONS

Dieter Margotte, Krefeld-Bockum, and Hugo Vernaleken, Krefeld, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 8, 1974, Ser. No. 458,620

Claims priority, application Germany, Apr. 26, 1973, 2321055

Int. Cl.² C08L *77/10*

U.S. Cl. 260—857 R **7 Claims**

1. A molding composition having an oxygen index of greater than 0.30 according to ASTM D-2863/70 comprising an aromatic polycarbonate containing 0.5 to 20 percent by weight of an aromatic polyamide fiber which is stable in a melt of the polycarbonate.

3,946,091
AROMATIC CO-POLYESTER ARTICLES SHOWING REDUCED CRAZING

Hiroshi Sakata, Kyoto; Takashi Okamoto, Hirakata, and Hirozo Hasegawa, Uji, all of Japan, assignors to Unitika Limited, Amagasaki, Japan

Continuation-in-part of Ser. No. 374,437, June 28, 1973, abandoned. This application Nov. 15, 1974, Ser. No. 524,183

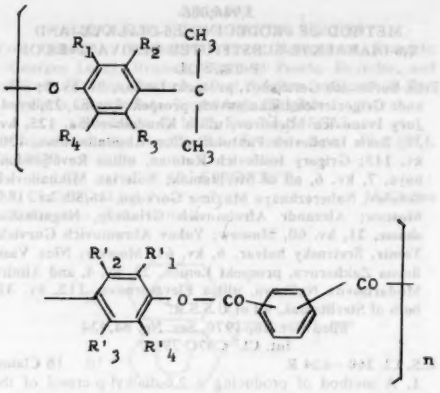
Claims priority, application Japan, June 28, 1972, 47-64648

Int. Cl.² C08G *39/02*

U.S. Cl. 260—860 **14 Claims**

1. A composition showing reduced crazing comprising an aromatic co-polyester and poly(ethylene terephthalate),

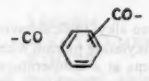
a. the aromatic co-polyester being a resinous product represented by the formula:



wherein R_1, R_2, R_3, R_4, R'_1, R'_2, R'_3 and R'_4, which may be the same or different, are members selected from the group consisting of hydrogen, chlorine, and bromine, and n is a positive integer which provides a resinous product;

b. the poly(ethylene terephthalate) being present in an amount of from 0.1 to 4 weight % based on the sum of the weight of said aromatic co-polyester and the poly (ethylene terephthalate); and

c. the moiety



in the above formula being terephthalic acid units and isophthalic acid units, which are present in said aromatic co-polyester at a molar ratio of about 9:1 to 1:9, respectively.

3,946,092
BROMINE SUBSTITUTED PHOSPHATES

Hermann Nachbur, Dornach, and Arthur Maeder, Therwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

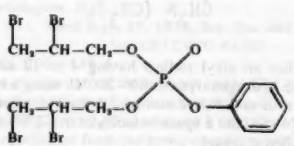
Filed June 27, 1974, Ser. No. 483,493

Claims priority, application Switzerland, July 3, 1973, 9671/73

Int. Cl.² C07F *9/12*

U.S. Cl. 260—964 **5 Claims**

1. A phosphate of the formula



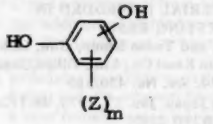
3,946,093

PROCESS FOR PREPARING POLYPHOSPHONATE

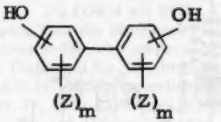
Noriaki Koto; Keiichi Kondo, and Naotake Okada, all of Ichihara, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Dec. 26, 1974, Ser. No. 536,577
Claims priority, application Japan, Apr. 27, 1974, 49-48018
Int. Cl.² C07F 9/40
U.S. Cl. 260—973 9 Claims

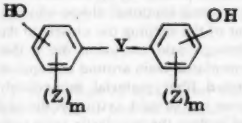
1. In a process for preparing a polyphosphonate which comprises polycondensing an aromatic diol having the formula (I) – (IV)



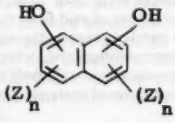
(I)



(II)

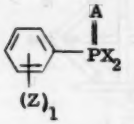


(III)



(IV)

wherein Z represents chlorine or bromine atom or a lower alkyl group and m represents 0 or an integer of from 1 to 4 and n represents 0 or an integer of from 1 to 3; Y represents an alkylene group, cycloalkylene group, sulfonyl group, carbonyl group, or oxygen atom; with a dihalide of arylphosphonic or thiophosphonic acid having the formula (V)



(V)

wherein A represents oxygen or sulfur atom; X represents chlorine or bromine atom, and l represents 0 or an integer of from 1 to 5, the improvement which comprises the steps of

1. maintaining in a high pressure zone a solution of said polyphosphonate in an organic solvent at a temperature of 125° – 300°C;
2. discharging the solution of step (1) into a low pressure zone wherein all or a portion of the organic solvent is flashed and porous solid polyphosphonate is formed, the pressure of said low pressure zone being lower than the vapor pressure of said organic solvent and lower than that of said high pressure zone; and
3. recovering said porous solid polyphosphonate.

3,946,094

METHOD FOR MANUFACTURING FILAMENTS OF CRYSTALLINE PLASTICS THEREOF

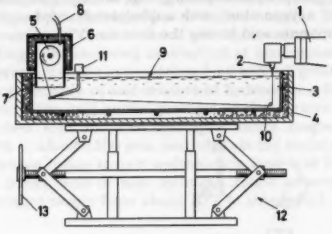
Hisaaki Kanetsuna, Yokohama, and Toshio Kurita, Tokyo, both of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 345,339, March 27, 1973, abandoned. This application Aug. 22, 1974, Ser. No. 499,611
Claims priority, application Japan, May 30, 1972, 47-53511
Int. Cl.² B05B 3/00; D01D 5/24
U.S. Cl. 264—28 2 Claims

1. A method for the manufacture of filaments of crystalline plastic selected from the group consisting essentially of polyamide, polyolefin and polyester which comprises the steps of

1. forming molten filaments of the crystalline plastic by melt spinning said crystalline plastic from a spinneret;
2. drafting said molten filaments at a mathematical draft of from 3 to 1000;
3. instantaneously cooling said drafted, molten filaments to a temperature from −30° to −100°C, thereby forming amorphous, orientable. glassy filaments;

4. stretching said amorphous, orientable, glassy filaments from 4 to 8 times at 10° to −80°C; and



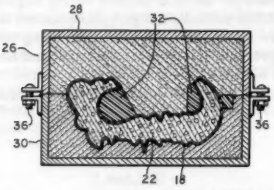
5. elevating the temperature of the filaments of step (4) so as to induce crystallization wherein the method of manufacture of steps (1) – (5) is continuous.

3,946,095

METHOD OF RESTORING THE SHAPE OF A FLEXIBLE-SHELL MODEL

Paul J. Dziulak, Chicago, Ill., assignor to Carnation Company, Los Angeles, Calif.

Filed Dec. 3, 1973, Ser. No. 420,875
Int. Cl.² B29D *27/04*; B32B *35/C*)
U.S. Cl. 264—36 **10 Claims**



1. A method of restoring the shape of a flexible-shell model having undercut portions comprising:

positioning inserts having a fixed standard shape in the undercut portions of the flexible-shell model;

charging the flexible-shell model with a measured amount of a foamable thermosetting plastic;

enclosing the flexible-shell model and associated inserts in a fixture configured to resist internal pressure and maintain a fixed standard shape;

foaming and curing the foamable thermosetting plastic in the flexible-shell model while the flexible-shell model is enclosed in the fixture and is forced outward by the foaming thermosetting plastic against the fixed standard shape of the fixture and the inserts.

3,946,096

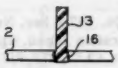
SECURING A FILAMENTOUS EXTRUDATE INTO A BASE MATERIAL MATRIX AT LEAST ONE OF WHICH IS EXPANDABLE

Paul L. Gomory, Bethesda, Md., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 31,245, April 23, 1970, Pat. No. 3,775,232. This application Aug. 28, 1973, Ser. No. 392,368
Int. Cl.² B29C *27/00*; B29D *27/00*
U.S. Cl. 264—46.1 **14 Claims**

1. A method for fixing together a filamentous extrudate and a base material matrix at least one of said extrudate and said base material matrix containing an expanding agent and thereby being expandable comprising:

a. inserting each individual extrudate filament at least into said base material matrix and



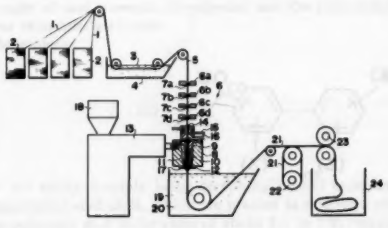
b. activating said expansion agent causing expansion of at least one of said extrudate and said base material matrix.

3,946,097

PROCESS FOR FORMING CONTINUOUS FIBER REINFORCED MATERIAL EMBEDDED IN THERMOSETTING RESIN

Mitsuhiro Takahashi, Fuchu, and Tadao Senoo, Gifu, both of Japan, assignors to Ube-Nitto Kasei Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1974, Ser. No. 430,515
Claims priority, application Japan, Jan. 27, 1973, 48-11266
Int. Cl.² B29D *23/05*
U.S. Cl. 264—90 **10 Claims**



1. A process for rapid production of fiber reinforced cured thermosetting resin material, comprising the steps of impregnating a continuously supplied reinforcing fiber material with an uncured thermosetting resin, shaping said impregnated fiber material into a predetermined cross-sectional configuration by passing said fiber material straight through a series of shaping dies which have openings arranged to gradually become smaller in cross-section, leading said shaped impregnated fiber material into a central passage of an extrusion die, said central passage having a cross-sectional shape which is substantially the same as that of the shaping die closest to the extrusion die, extruding through said extrusion die a thin molten layer of molten thermoplastic resin around and spaced from said shaped impregnated fiber material immediately after the fiber material comes out of said extrusion die and converging said thin layer of molten thermoplastic resin radially toward and in the direction of advancement of said shaped impregnated fiber material while producing a negative pressure between the inside of said extruded thermoplastic resin and said shaped impregnated fiber material for firmly covering said shaped impregnated fiber material with said molten thermoplastic resin, immediately leading said thus covered fiber material into a cooled water tank at a speed of about 1 m/sec. to solidify said thermoplastic resin and thereby to cover said shaped impregnated fiber material, cutting said covered fiber material into predetermined lengths of more than 10 m, and thereafter passing a plurality of cut pieces of said fiber material simultaneously and in spaced parallel relation through a heated water tank to cure said thermosetting resin, whereby the covered fiber material can be produced at a relatively high speed and the thus rapidly produced covered material can be cured at a slower speed.

3,946,098

PREPARATION OF FEED MATERIAL FOR A BLAST FURNACE

Colin Frank Harris, Chipping Sodbury, near Bristol, England, assignor to Metallurgical Processes Ltd., Nassau, Bahamas and I.S.C. Smelting Limited (Metallurgical Development Company), London, England

Filed Dec. 11, 1973, Ser. No. 423,748

Claims priority, application United Kingdom, Dec. 11, 1972, 57093/72; May 30, 1973, 25631/73

Int. Cl.² B01J 2/12

U.S. Cl. 264—117 8 Claims

1. In a process for producing a briquetted oxidic feed for a blast furnace comprising briquetting an oxidic material selected from the group consisting of zinc oxide powder and zinc oxide and lead oxide powder at a temperature of from 500° to 800°C and a pressure of from 1 to 20 tons/square inch, without the addition of a binder, to form coherent briquettes suitable for feeding to a blast furnace, the improvement comprising the steps of:

a. pelletizing the oxidic material powder of a fineness insufficient to form coherent briquettes suitable for feeding to a blast furnace into substantially spherical pellets having an average diameter of from 2 to 10 millimeters; and

b. heating the pellets to a temperature of from 500°C. to 800°C prior to the briquetting step.

3,946,099

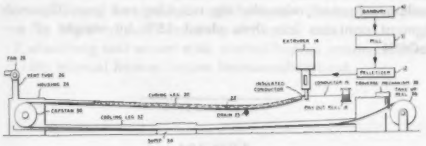
PRESSURELESS CURE SYSTEM FOR CHEMICALLY CROSS-LINKING ETHYLENE CONTAINING POLYMERS, TO FORM AN INSULATED CONDUCTOR

Burton Thornley MacKenzie, Jr., Monroe, Conn., assignor to General Electric Company, New York, N.Y.

Division of Ser. No. 305,544, Nov. 10, 1972, Pat. No. 3,859,247, which is a continuation-in-part of Ser. No. 91,357, Nov. 20, 1970, abandoned, which is a continuation-in-part of Ser. No. 748,816, July 30, 1968, abandoned. This application Oct. 29, 1974, Ser. No. 518,384

Int. Cl.² B29F 3/08

U.S. Cl. 264—174 2 Claims



1. A method of making an electric cable having a cured relatively dense and substantially non-porous insulating composition about a conductor comprising ethylene containing polymer and mineral filler cured at substantially atmospheric pressure, comprising the steps of: treating a mineral filler with tetramethyltetravinylcyclotetrasiloxane by admixing said mineral filler with about 0.15 to 4.0 percent of tetramethyltetravinylcyclotetrasiloxane by weight of the filler, and preparing the insulating composition by admixing the ingredients comprising an ethylene containing polymer, said mineral filler and treating tetramethyltetravinylcyclotetrasiloxane, and curing agent; forming the insulation of admixed composition about a conductor; and thereafter heating the said formed insulation of the admixed composition at about atmospheric pressure in a non-aqueous heat transfer medium to a temperature and for a dwell time sufficient to effect an in situ cross-linking cure of the ethylene containing polymer to a relatively dense and substantially non-porous insulation of filled polymeric composition.

3,946,100

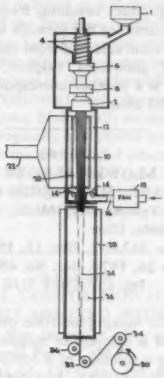
PROCESS FOR THE EXPEDITIOUS FORMATION AND STRUCTURAL MODIFICATION OF POLYESTER FIBERS

Herbert L. Davis, Convent Station; Michael L. Jaffee, North Plainfield, and Michael M. Besso, West Orange, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Sept. 26, 1973, Ser. No. 400,863

Int. Cl.² D01D 5/12

U.S. Cl. 264—210 F 32 Claims



1. An improved process for expeditously forming and structurally modifying a polyester filamentary material consisting essentially of:

a. extruding a molten fiber-forming polyester capable of undergoing crystallization through a shaped orifice to form a molten filamentary material,

b. passing the resulting molten filamentary material in the direction of its length through a solidification zone provided with a gaseous atmosphere at a temperature below the glass transition temperature thereof wherein said molten filamentary material is uniformly quenched and is transformed to a solid filamentary material,

c. passing said resulting filamentary material in the direction of its length through a conditioning zone provided with a gaseous atmosphere at a tempereature above the glass transition temperature thereof and below the melting temperature thereof for a residence time of about 0.0016 to 0.6 second, wherein substantial crystallization of said previously solidified filamentary material takes place, and

d. withdrawing the resulting filamentary material from said conditioning zone at a rate of about 2500 to 6000 meters per minute while under a stress of about 0.1 to 1.0 gram per denier; said resulting filamentary material exhibiting no substantial tendency to undergo self-crimping upon the application of heat, exhibiting a mean tenacity of at least 3.25 grams per denier, a mean initial modulus of at least 55 grams per denier, and a mean elongation of 50 percent or less when present in a multifilament yarn at 25°C., and exhibiting a mean longitudinal yarn shrinkage of less than 5 percent when present in a multifilament yarn at 100°C.;

with said processing of said polyester filamentary material following said extrusion being conducted while exerting a constant tension thereon in the absence of stress isolation along the length of the same intermediate said shaped orifice and said point of withdrawal from said conditioning zone.

3,946,101
FILTERING MATERIAL

Alfred J. Harendza-Harinxma, Lawrenceville, N.J., assignor to Alfred J. Harendza-Harinxma, Lawrenceville; Peter J. Catanese, Trenton; Samuel A. LaPaglia and Deane W. Merry, both of Pennington, all of, N.J., part interest to each

Division of Ser. No. 210,043, Dec. 20, 1971, abandoned, which is a continuation of Ser. No. 69,760, Sept. 4, 1970, abandoned. This application July 10, 1973, Ser. No. 378,011

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—210 **4 Claims**

1. A method of filtering noxious, carcinogenic or objectionable gases from a mixture of gases comprising the step of passing said mixture of gases through a filter containing the complex metallic product resulting from re-acting cellulose with an inorganic nitrate of the formula $Me(NO_3)_n$ where Me represents a metal atom selected from the group consisting of manganese, nickel, aluminum, calcium, iron, sodium, zinc, and copper and *n* is a number corresponding to the valence number of the metal atom.

3,946,102
LIQUID OCTA 2-LOWER ALKOXY ETHOXIDES OF ALUMINUM AND (MAGNESIUM OR CALCIUM)

Ian M. Thomas, Temperance, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 313,662, Dec. 11, 1972. This application July 26, 1974, Ser. No. 492,346

Int. Cl.[2] C01F *7/16*

U.S. Cl. 423—600 **6 Claims**

1. The method for making an oxide product of the formula MAl_2O_4 wherein M is calcium or magnesium comprising the steps of combining a solution of a compound of the formula $MAl_2(O—CH_2—CH_2—O—R)_8$, wherein R is a C_1 to C_4 alkyl, in a polar organic solvent with at least about 6 moles of water per mole of said compound so as to hydrolyze said compound and form a hydrolyzed precipitate; separating said polar organic solvent and heating said hydrolyzed precipitate at a temperature and for a time sufficient to remove residual carbon moieties but at a temperature less than 700° C. so as to form an anhydrous, amorphous, small particle size, high surface area, high purity oxide product of the formula MAl_2O_4.

4. The method for forming an oxide of magnesium or calcium and aluminum which comprises reacting magnesium or calcium and aluminum with a stoichiometric excess of a compound of the formula R—O—CH_2—CH_2—O—H wherein the ratio of the gram atoms of aluminum to maganesium or calcium is about 2:1 or less for a time sufficient to form a reaction mass containing a compound of the formula $MAl_2(O—CH_2—CH_2—O—R)_8$ wherein M is Ca or Mg and R is a C_1 to C_4 alkyl, combining the reaction mass as above with at least about 6 moles of water per mole of said $MAl_2(O—CH_2—CH_2—O—R)_8$ compound so as to precipitate a hydrolyzed product, separating said excess of said R—O—CH_2—CH_2—O—H compound from said reaction mass, and heating said hydrolyzed product at a temperature and for a time sufficient to dry said product and remove residual carbon moieties but at a temperature less than about 700° C. so as to form an anhydrous, amorphous, particulate product of the formula $CaAl_2O_4$ or $MgAl_2O_4$.

3,946,103
PRODUCTION OF PRECIPITATED RED IRON (III) OXIDE PIGMENT RELATIVELY FREE OF α-FEOOH

Franz Hund, Krefeld-Bockum, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 19, 1973, Ser. No. 398,730

Claims priority, application Germany, Oct. 7, 1972, 2249274

Int. Cl.[2] C01G *49/02;* **C09D** *5/00*

U.S. Cl. 423—633 **12 Claims**

1. In the production of a precipitated red iron (III) oxide pigment of hematite structure wherein an aqueous iron (II) salt solution is mixed with an aqueous alkali solution in substantially equivalent quantities to produce an aqueous suspension of iron (II) hydroxide or carbonate, the suspension is oxidized by passing oxygen-containing gases through it with stirring under atmospheric pressure at a temperature of about 0° to 50°C to form a suspension of iron (III) seed, and the resulting iron (III) seed suspension is allowed to grow into precipitated red iron (III) oxide pigment by further oxidation with an oxygen-containing gas at a temperature of about 50° to 100°C in the presence of more iron (II) salt and alkali solution or in the presence of iron (II) salt and metallic iron at a pH-value kept in the acid range, the improvement which comprises producing the iron (III) seed suspension by oxidation with the oxygen-contaning gases for about 4 to 30 minutes and in the presence of at least one foreign modifying substance selected from the group consisting of a compound of magnesium, calcium, copper, zinc, aluminum, antimony, phosphorus, arsenic, vandium and silicon, so that lattice-distorted chemically reactive finely divided delta—FeOOH seeds are formed, whereby the resulting red iron (III) oxide pigment contains less than about 15% by weight of α—FeOOH.

7. In the production of a precipitated red iron (III) oxide pigment of hematite structure wherein an aqueous iron (II) salt solution is mixed with an aqueous alkali solution in substantially equivalent quantities to produce an aqueous suspension of iron (II) hydroxide or carbonate, the suspension is oxidized by passing oxygencontaining gases through it with stirring under atmospheric pressure at a temperature of about 0° to 50°C to form a suspension of iron (III) seed, and the resulting iron (III) seed suspension is allowed to grow into precipitated red iron (III) oxide pigment by further oxidation with an oxygen-containing gas at a temperature of about 50° to 100°C in the presence of more iron (II) salt and alkali solution or in the presence of iron (II) salt and metallic iron at a pH-value kept in the acid range, the improvement which comprises producing the iron (III) seed suspension by oxidation with the oxygen-containing gases for about 4 to 30 minutes and in the presence of at least one foreign modifying substance selected from the group consisting of a trihydric or polyhydric alcohol, aliphatic monocarboxylic acid, dicarboxylic acid with more than one alcohol group in the molecule, aliphatic tricarboxylic acid with at least one alcohol group in the molecule, and monosaccharide, disaccharide or polysaccharide hydroxyaldehyde or hydroxyketone, so that lattice-distorted chemically reactive finely divided delta—FeOOH seeds are formed, whereby the resulting red iron (III) oxide pigment contains less than about 15% by weight of α—FeOOH.

3,946,104
METHOD OF PRODUCING AN HOMOGENEOUS GAS MIXTURE

Friedrich Forster, Dortmund-Wellinghofen; Erich Barth, Dortmund, and Heinz-Jochen Keller, Dortmund-Horde, all of Germany, assignors to Friedrich Uhde GmbH, Dortmund, Germany

Division of Ser. No. 419,909, Nov. 29, 1973, Pat. No. 3,895,919. This application July 8, 1974, Ser. No. 486,495

Claims priority, application Germany, Jan. 13, 1973, 2301644

Int. Cl.[2] C01B *1/00;* **C01C** *1/00*

U.S. Cl. 423—659 **1 Claim**

1. The method of producing a homogenous gas mixture from two gas streams of different parameters, for multistage exothermic or endothermic reactions consisting of

a. flowing a reaction gas stream through a catalyst layer to a relatively open space for equalizing the expansion and velocity of the reaction gas stream,

b. the free cross-sectional area of the reaction gas stream in said open space being greater than the free cross-sectional area of the catalyst layer,

c. causing the reaction gas stream in such space to pass concurrently through a plurality of parallel mixing zones,
d. introducing quench gas through a two-stage pressure reduction to said mixing zones including first passing said quench gas to a closed area around said mixing zones and permitting expansion thereof to spaces around said zones so as to effect the first of said pressure reductions,
e. causing quench gas to pass from the spaces around said zones into said zones so as to effect the second of said pressure reductions,
f. passing the resultant reaction gas and quench gas mixture in parallel flow through restricted openings in said zones thereby increasing the velocity and effecting a complete homogenous mixture of the gases, and
g. passing the homogenous gas mixture to the entrance of a second catalyst layer downstream.

3,946,105

PREPARATION OF ANTI-α1-FETOGLOBULIN

Hidetaka Nagai, Hachioji; Eiichi Sato, Funabashi, and Fujio Kobayashi, Higashimurayama, all of Japan, assignors to Kowa Company, Ltd., Nagoya, Japan

Division of Ser. No. 99,312, Dec. 17, 1970, Pat. No. 3,819,822. This application Feb. 22, 1973, Ser. No. 334,877

Claims priority, application Japan, Dec. 18, 1969, 44-101870; Feb. 19, 1970, 45-14335; July 29, 1970, 45-66238; Aug. 28, 1970, 45-75452

Int. Cl.² A23J *1/06;* **B01D** *13/00, 15/08;* **G01N** *1/00*

U.S. Cl. 424—12 **4 Claims**

1. A process for the preparation of anti-α_1-fetoglobulin which is used for the preparation of a diagnostic agent for primary hepatoma which comprises:
a. purifying the ascites from a patient having a primary hepatoma by means of gel filtration chromatography;
b. dialyzing the α_1-fetoglobulin fraction obtained from purifying step (a) so as to obtain α_1-fetoglobulin;
c. immunizing animals with said α_1-fetoglobulin of step (b);
d. bleeding said immunized animals;
e. separating an anti-α_1-fetoglobulin-containing serum from the blood of said bled animals; and
f. absorbing said serum with normal human serum or insoluble normal human serum immunoabsorbent.

3,946,106

MICROSEALED PHARMACEUTICAL DELIVERY DEVICE

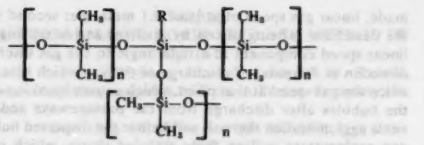
Yie W. Chien, Skokie, and Howard J. Lambert, Deerfield, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Oct. 24, 1974, Ser. No. 517,454

Int. Cl.² A61K *9/00, 9/26*

U.S. Cl. 424—15 **25 Claims**

1. A microsealed pharmaceutical delivery device comprising a sectioned length of flexible medical grade silicone polymer hollow tubing as a biologically acceptable polymer container with as many perforations in the wall of the tubing when unsealed at each end as to expose up to 40% of an inner biologically acceptable silicone polymer matrix contained with the biologically acceptable polymer container, said biologically acceptable silicone polymer matrix having the formula



wherein R is alkoxy having 1–7 carbon atoms, alkyl having 1–10 carbon atoms, phenyl, vinyl, or allyl, wherein *n* is about 100–5000 and having 10–200 micron microsealed compartments throughout, said microsealed compartments containing pharmaceutical saturated 30–60% polyethylene glycol molecular weight 380–420 in water as a hydrophilic solvent system wherein the ratio of the partition coefficient of the pharmaceutical between the hydrophilic solvent system and inner biologically acceptable silicone polymer matrix to the solubility of the pharmaceutical in the hydrophilic solvent system is between 1 and 10^{-4}(ml/mcg), said pharmaceutical being diffusible through the inner biologically acceptable silicone polymer matrix and biologically acceptable polymer container at a constant rate when the microsealed pharmaceutical delivery device is in an aqueous environment, said hydrophilic solvent being non-diffusible through the inner biologically acceptable silicone polymer matrix and biologically acceptable polymer container.

3,946,107

INSECTICIDAL COMPOSITION OF *BACILLUS THURINGIENSIS* ADMIXED WITH PYRETHRUM

Edward B. Westall, San Jacinto, Calif., assignor to Nutrilite Products, Inc., Buena Park, Calif.

Filed May 10, 1974, Ser. No. 468,865

Int. Cl.² A01N *15/00, 9/08*

U.S. Cl. 424—93 **8 Claims**

1. An improved insecticidal composition comprising *Bacillus thuringiensis*, Berliner admixed with the natural botanical insecticide Pyrethrum in a weight ratio of *Bacillus thuringiensis*, Berliner to Pyrethrum of from about 2 to 1 to about 1 to 2.

3,946,108

DENTIFRICE

Kenneth Tomlinson, Bramhall, and Michael Harrison, New Castle upon Tyne, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 202,664, Nov. 26, 1971, abandoned. This application Feb. 27, 1974, Ser. No. 446,453

Int. Cl.² A61K *7/16*

U.S. Cl. 424—49 **4 Claims**

1. A method for manufacturing a visually clear dentifrice containing gas bubbles which comprises making a gascontaining viscous, extrudible gel dentifrice comprising sodium aluminosilicate polishing agent, a gelling agent selected from the group consisting of Irish moss, sodium carboxymethyl cellulose and synthetic inorganic silicated clay of the formula $[Si_8Mg_{5.1}Li_{0.8}H_{7.6}O_{24}]^{0.6-}Na^+_{0.6}$, a vehicle selected from the group consisting of (a) sorbitol and water and (b) sorbitol, glycerol and water, and sodium lauryl sulfate foaming agent, in which dentifrice the polishing agent is of particle sizes in the 1 to 65 micron range, insoluble in the dentifrice and of a refractive index in the range of 1.4 to 1.5, like that of the rest of the dentifrice, degassing the gas-containing dentifrice, mixing with the degassed dentifrice bubbles of a gas selected from the group consisting of air and nitrogen, which bubbles are of diameters in the 1 to 4 mm. (equivalent spherical diameter) range, and distributing the bubbles throughout the dentifrice by directing air or nitrogen through sparger passageways or passageways in a porous multi-passage material, which passageways are of outlet diameter(s) in the range of 1 to 4 mm., into the dentifrice at a temperature of 30° to 60°C. and of a viscosity at said temperature over 5,000 centipoises, at

made, linear gas speed of at least 0.1 meter per second while the dentifrice is being mixed by a stirrer and is moving at a linear speed component at a right angle to the gas discharge direction at the point of discharge of the gas which is at least twice the gas speed at that point, which causes breaking off of the bubbles after discharge from the passageways and prevents agglomeration thereof, and before the dispersed bubbles can agglomerate or lose their globular shape, which is obtained when they are dispersed in the dentifrice, filling the dentifrice so mad, containing 2 to 40 gas bubbles per cubic centimeter, into a dispensing container or tube within one hour after addition of the gas and cooling the dentifrice in the container to room temperature, at which it has a viscosity over 200,000 centipoises, to produce a visually clear gel dentifrice having bubbles substantially evenly distributed through it which are stable in position at least until the dentifrice is extruded or otherwise discharged from the container.

3,946,109

ANIMAL FEED COMPOSITION CONTAINING CERTAIN VITAMIN COMBINATIONS

Ernst Kolb, Am Rain 612, 4922 Butzberg, Kanton Bern, Switzerland

Continuation-in-part of Ser. No. 386,545, Aug. 8, 1973, abandoned, which is a continuation of Ser. No. 42,899, June 2, 1970, abandoned, which is a continuation-in-part of Ser. No. 656,051, July 26, 1967, abandoned. This application Dec. 30, 1974, Ser. No. 537,346

Int. Cl.² A61K *35/12, 31/355, 31/195, 31/07*

U.S. Cl. 424—95 **9 Claims**

1. An additive for animal feed mixtures, said additive comprising a synergistic combination of catabolic and anabolic ingredients effective in growth and energy promotion, the combination consisting essentially of an anabolic substance selected from the group consisting of vitamin A, vitamin E and vitamin T (Goetsch), in an amount of about 1 to 3.4 grams per ton of the total feed mixture, and thyroxine as the catabolic ingredient, said thyroxine being present in an amount exhibiting a biological activity corresponding to 15 to 25 milligrams of L-thyroxine per ton of total feed mixture.

3,946,110

MEDICINAL COMPOSITIONS AND METHODS OF PREPARING THE SAME

William H. Hill, St. Paul, Minn., assignor to Peter, Strong Research and Development Company, Inc., Port Chester, N.Y.

Continuation of Ser. No. 474,599, May 30, 1974, abandoned, which is a continuation of Ser. No. 277,900, Aug. 4, 1972, abandoned, which is a continuation of Ser. No. 863,053, Oct. 2, 1969, abandoned. This application Feb. 10, 1975, Ser. No. 548,540

Int. Cl.² A61J *3/10;* **A61K** *9/20*

U.S. Cl. 424—230 **8 Claims**

1. A method of providing a pharmaceutical product, which method comprises preparing an initial mix of substantially equal parts by weight of aspirin and pectin, spraying water on the solid mix in successive small increments while agitating the said mix, the amount of water thus added being above 10% but below that required to change the mix to a lumpy paste, subjecting the moisturized mix to isothermal distillation drying conditions until the water content is reduced to the approximate range of 2 to 10% by weight in addition to the natural moisture content of the pectin used, and compressing the resulting material into tablets.

3,946,111

PHARMACEUTICAL COMPOSITIONS CONTAINING 1 OR 2-MONO AND DIALKYL SUBSTITUTED THIENOBENZOPYRANS AND PHARMACOLOGICAL USES THEREOF

Martin Winn, Deerfield, Ill.; Raj Kumar Razdan, Belmont; Haldean Cloyce Dalzell, Weston, both of Mass., and Joyce Ruth Krei, Glenview, Ill., assignors to Sharps Associates, Cambridge, Mass.

Division of Ser. No. 392,636, Aug. 29, 1973, Pat. No. 3,895,034. This application Nov. 18, 1974, Ser. No. 524,626

Int. Cl.² A61K *31/38*

U.S. Cl. 424—275 **2 Claims**

2. The method of inducing analgesia in an animal which comprises administering to the animal a safe but effective amount of 1,2-dihydro-1,4,4-trimethyl-9-hydroxy-7-(3-methyl-2-octyl)-4H-thieno-[2,3-c][1] benzopyran or 1,2-dihydro-2,4,4-trimethyl-9-hydroxy-7-(3-methyl-2-octyl)-4H-thieno-[2,3-c][1] benzopyran to effect analgesia in the animal.

3,946,112

PHARMACEUTICALLY USEFUL BIS-BASIC ESTER AND THIOESTER DERIVATIVES

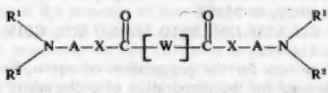
Irving Shemano, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Filed June 15, 1973, Ser. No. 370,291

Int. Cl.² A61K *31/235*

U.S. Cl. 424—308 **9 Claims**

1. A method of treating conditions of delayed hypersensitivity which comprises administering to a patient in need thereof a compound selected from the formula



wherein [W] represents an aromatic polycyclic nucleus selected from fluoranthene, fluorene, fluoren-9-ol, or fluoren-9-one X is selected from oxygen or sulfur; A is selected from a straight or branched alkylene chain of from 2 to 6 carbon atoms; and each of R^1 and R^2 is selected from hydrogen, straight or branched lower alkyl of from 1 to 4 carbon atoms or alkenyl of 3 to 6 carbon atoms having the vinyl unsaturation in other than the 1-position; and pharmaceutically acceptable acid addition salts thereof, in an amount effective to suppress delayed hypersensitivity.

3,946,113

CONTINUOUS SEPARATING AND STANDARDIZING OF MILK

Dale A. Seiberling, Roscoe, Ill., assignor to Economics Laboratory, Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 282,497, Aug. 21, 1972, Pat. No. 3,829,584. This application May 31, 1974, Ser. No. 474,914

The portion of the term of this patent subsequent to Aug. 13, 1991, has been disclaimed.

Int. Cl.² A23C *7/00, 13/02*

U.S. Cl. 426—231 **13 Claims**

1. A method for treating milk comprising the steps of:

a. introducing milk into a centrifugal separator means;

b. measuring the flow rate of the milk introduced into said separator means and producing an electrical analog signal corresponding to said flow rate;

c. separating said milk into its skim and cream components within said separator means;

d. measuring the flow rate of the cream component exhausted from said separator means and producing an electrical analog signal corresponding to said flow rate;

e. transmitting electrical signals, obtained as a result of said steps (b) and (d), to a programmed analog logic control

means and correlating said electrical signals to produce an electrical control signal; and

f. controlling the flow rate of cream exhausted from said separator means responsive to said electrical control signal.

3. Apparatus for treating fluid having a plurality of components including a first component separable from said fluid in essentially pure form and a partial combined component which remains after said first component has been separated, said partial combined component comprising a mixture of said first component and at least a second component, said apparatus comprising:

a. centrifugal separator means for separating out essentially pure first component from said fluid, said centrifugal separator means having an inlet and first and second outlet;

b. first conduit means connected to said inlet for conveying the fluid to said separator;

c. first flow meter means positioned in said first conduit means for determining the flow rate of said fluid and for producing an electrical analog signal corresponding to said flow rate;

d. second conduit means connected to said first outlet in said separator for removing said partial combined component;

e. third conduit means connected to said outlet in said separator for removing the first component of said fluid;

f. second flow meter means positioned in said second conduit means for determining the flow rate of said partial combined component and for producing an electrical analog signal corresponding to said flow rate;

g. programmed analog logic control means for receiving electrical signals from said first and second flow meters and for producing an electrical control signal responsive to the flow rates within said first and second conduit means; and

h. liquid flow control means positioned in said second conduit upstream from said second flow meter and electrically connected to said logic control means, said flow control means being controllable by said control signal for regulating the flow rate of said partial combined component through said second conduit means to control the volume of said partial combined component passing therethrough.

3,946,114

PROCESS FOR MAKING PROTEIN FROM HYDROCARBONS

Utah Tsao, Jersey City, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Nov. 5, 1973, Ser. No. 412,728
Int. Cl.[2] C12C *11/18*
U.S. Cl. 426—60 **4 Claims**

1. In a process of growing yeast from hydrocarbons comprising fermenting hydrocarbons with the yeast in an aqueous nutrient solution containing phosphate, forming a yeast brew which comprises the yeast and partially depleted nutrient solution and separating the yeast from a partially depleted nutrient solution, the improvement which consists in introducing a source of calcium into the yeast brew to precipitate the contained phosphate therein as calcium phosphate, and recovering the product consisting essentially of the yeast containing calcium phosphate from the solution.

3,946,115

HIGH PERFORMANCE HORSE FEED AND METHOD OF MAKING

Leslie H. Brever, Alhambra, Ill., and Frederick H. Steinke, Crestwood, Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed July 10, 1974, Ser. No. 487,077
Int. Cl.[2] A23K *1/18*
U.S. Cl. 426—72 **8 Claims**

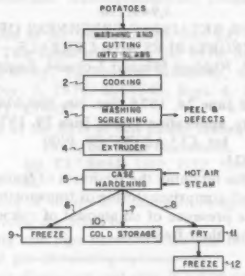
1. An improved method of making a high performance horse feed, said improved method comprising the steps of grinding and extruding at from about 115° to about 163°C. to a bushel weight of about 32 pounds per bushel and a particle size of from ⅛ to 3 inches in length and a mean diameter of from 0.15 to 0.6 inch, a combination comprising, by weight of the combination, from about 35 to 65% farinaceous material selected from the group consisting of wheat, wheat flour, wheat meal by-products and corn from 10 to 30% proteinaceous material selected from the group consisting of soybean meal, soy flour, peanut meal, cottonseed meal and safflower seed meal, from about 5 to 30% fibrous materials selected from the group consisting of soy hulls, cottonseed hulls, and rice hulls and from 3 to 4% nutritional supplements and between about 25 and 35% added moisture based on the weight of the combination; and thereafter drying to about 10% and coating the extruded combination with from 2 to 10% by weight vegetable oil selected from the group consisting of soybean oil, corn oil, safflower oil, cottonseed oil and peanut oil.

3,946,116

PREFORMED POTATO PRODUCTS

Merle L. Weaver, Martinez; Earl Hautala, Richmond, and Masahide Nonaka, Moraga, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 136,926, April 23, 1971, Pat. No. 3,812,274. This application Sept. 13, 1972, Ser. No. 288,803
Int. Cl.[2] A23L *1/216*
U.S. Cl. 426—103 **3 Claims**



1. An intermediate useful for the preparation of fried products, said intermediate consisting solely of potato flesh, and comprising a shaped body of compressed cooked potato mash enveloped in a thin shell of case-hardened potato tissue.

3,946,117

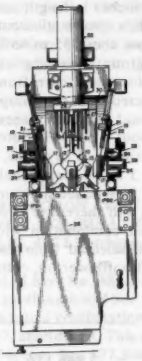
POULTRY CARCASS TREATING PROCESS

James M. Blair; Michael Sebring, both of Phoenix, Ariz.; Warren H. Underwood, and William P. Bley, both of Minneapolis, Minn., assignors to Armour and Company, Phoenix, Ariz.

Division of Ser. No. 106,492, Jan. 14, 1971, Pat. No. 3,754,302. This application July 25, 1973, Ser. No. 382,409

Int. Cl.[2] A22C *21/00*

U.S. Cl. 426—281 10 Claims



1. A method for positioning a poultry carcass having a V-shaped notch to facilitate treatment of said carcass comprising supporting said carcass from the underneath side, pressing said body rearwardly from within and at the apex of said V-shaped notch, pressing said carcass forwardly from the rear side thereof whereby said carcass is held between said three points of engagement, while said carcass is so held passing hollow needles through a surface of said carcass and into the meat thereof at points which are at a predetermined distance from said apex, and injecting fluid through said needles into said meat.

3,946,118

PROCESS FOR RETAINING FRESHNESS OF FRUITS, VEGETABLES AND CEREALS

Isao Sakai, 2-11, Nishiogi Minami 1-chome, Suginam, Tokyo, Japan

Filed June 24, 1975, Ser. No. 590,016

Claims priority, application Japan, June 29, 1974, 49-74597

Int. Cl.[2] A23B *7/00, 9/00*

U.S. Cl. 426—321 2 Claims

1. A process for retaining the freshness of fruits, vegetables and cereals which comprises storing or transporting the aforesaid foods in the presence of an amount of calcium peroxide effective to retain their freshness.

3,946,119

OPTIONALLY SUBSTITUTED α-TERTIARY BUTYL-P-PHENOXYBENZYLAMINES AND THEIR USE AS HYPOLIPIDEMIC AGENTS

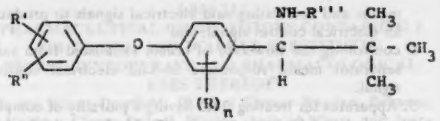
Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Dec. 23, 1974, Ser. No. 535,436

Int. Cl.[2] H61K *31/135*

U.S. Cl. 424—330 19 Claims

13. The method for treating a mammal having lipidemia comprising administering a hypolipidemic effective amount to said mammal of a compound of the formula:



wherein

R is hydrogen, alkyl of 1 to 4 carbon atoms, or halo of atomic weight of from 18 to 36,

R′ and R″ are independently hydrogen, halo of atomic weight of from 18 to 36, alkyl of 1 to 4 carbon atoms, or alkoxy of 1 to 4 carbon atoms,

R‴ is alkyl of 1 to 5 carbon atoms, and

n is 1 or 2,

or a pharmaceutically acceptable acid addition salt thereof.

3,946,120

HIGH PROTEIN BREAD SUBSTITUTE AND METHOD FOR PREPARING SAME

William Vincent, Dorset, and Hartmut Zeller, Grand-Lancy, both of Switzerland, assignors to Wander Ltd., Berne, Switzerland

Continuation-in-part of Ser. No. 460,649, April 12, 1974, abandoned. This application May 22, 1974, Ser. No. 472,163

Claims priority, application Switzerland, Apr. 16, 1973, 5409/73

Int. Cl.[2] A21D *8/00, 10/00*

U.S. Cl. 426—532 25 Claims

1. A low-starch, high-protein bread substitute obtained wholly from other than grain flour by baking a water-containing dough aerated by vigorous stirring comprising at least 15 percent by weight of milk protein, at least 1 percent by weight egg protein, at least 10 percent by weight lipids, and at least 30 percent by weight carbohydrates wherein at least 50 percent by weight of the carbohydrates are derived from milk.

3,946,121

CALORIE-FREE SWEETENER WITHOUT SOURNESS

Marvin E. Eisenstadt, Neponsit, N.Y., assignor to Cumberland Packing Corporation, Brooklyn, N.Y.

Filed Aug. 8, 1974, Ser. No. 495,785

Int. Cl.[2] A23L *1/236*

U.S. Cl. 426—548 4 Claims

1. A sweetening composition consisting essentially of between about 2–10% by weight of a saccharine artificial sweetener, about 2–14% by weight of an edible bicarbonate, and about 56–96% by weight of glucono delta lactone.

3,946,122

PROCESS OF PREPARING MARGARINE PRODUCTS

Jacob Arie Scharp, Vlaardingen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 178,513, Sept. 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 780,897, Dec. 3, 1968, abandoned. This application Jan. 14, 1974, Ser. No. 433,170

Claims priority, application Luxemburg, Dec. 4, 1967, 55012

Int. Cl.² A23D 3/02

U.S. Cl. 426—604 3 Claims

1. A process for preparing margarine or margarine-like plastic fatty emulsion food spread resembling butter in consistency and containing an emulsifier or an emulsifier system exhibiting both stabilizing and destabilization functions comprising the steps of:

a. preparing an aqueous phase from the group consisting of water, skim milk, an aqueous phase containing milk solids and mixtures thereof with an effective amount of up to about 10% by weight of the spread of a stabilizing emulsifier to stabilize the emulsion during homogenization as well as any heat treatment;

b. preparing a molten fat, said fat having a dilatation value at 25°C of about 100 to 400 $mm^2/25g$;

c. preparing a fatty phase by mixing with said molten fat an effective amount of up to about 1% by weight of the spread of a destabilization emulsifier to maintain the final food spread in a destabilized condition;

d. dispersing 70 to 90 parts by weight of said molten fatty phase in 10 to 30 parts by weight of said aqueous phase and forming an emulsion wherein the fatty phase is the dispersed phase; and

e. cooling said emulsion while at rest to a temperature between 10°C and −25°C until the percentage of solid crystallized material amounts to at least 5% to form the spread, and wherein during said cooling step there is effected a destabilization of said spread to a degree of 0.15 to 0.75 whereby there is distributed in the dispersed phase a proportion of the aqueous component being measured by a decrease in electrical conductivity of the product, said decrease being not less than 5% and not more than 80% of the electrical conductivity of said emulsion prior to crystallization, said emulsifier or emulsifier system having stabilizing and destabilizing properties, being present in an amount of from about 0.1% to about 10% by weight of the total emulsion.

3,946,123

CANNED PET FOOD

Keith L. Hanna, Westminster, Calif., assignor to Star-Kist Foods, Inc., Terminal Island, Calif.

Filed Mar. 10, 1975, Ser. No. 556,718

Int. Cl.² A23K 1/10

U.S. Cl. 426—643 19 Claims

1. A canned pet food consisting essentially of an aqueous medium and:

from 15 to about 60 weight percent of meat comprising from 20 to 100 percent fish; and

from 3 to about 10 weight percent, expressed on their dry weight, of chunks having a size from 0.1 to 1.5 inches of a flavored cereal product consisting of the following components, expressed on their dry weight:

85 to 99 weight percent of a cereal product selected from the class of hard, red and durum wheat flours and farinas;

0.05 to 5 weight percent of glycerol monostearate; and

0.05 to 15 weight percent of a flavoring agent selected from the class consisting of cheese, cheese flavoring agents, fish and fish by-products.

3,946,124

METHOD OF FORMING A COMPOSITE STRUCTURE

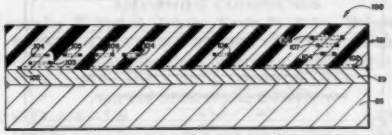
Jack E. Mee, Anaheim; David M. Heinz, Orange; Thomas N. Hamilton, Fullerton; Paul J. Besser, Mission Viejo, and George R. Pulliam, Anaheim, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 16,447, March 4, 1970, abandoned. This application Mar. 2, 1972, Ser. No. 233,832

The portion of the term of this patent subsequent to Feb. 29, 1989, has been disclaimed.

Int. Cl.² H01F 10/02

U.S. Cl. 427—8 6 Claims



1. A method of forming a composite structure comprising the steps of:

providing a single crystal substrate; and

forming a single crystal, iron-containing magnetic film less than 25 microns thick on said substrate with sufficient mechanical strain in said film to provide said film with sufficient uniaxial anisotropy for the formation of bubble domains therein,

whereby said film has a JQ-oxide formulation wherein,

the J constituent of said film formulation having at least one element selected from the group consisting of cerium, praseodynium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium, lanthanum and yttrium, and

the Q constituent of said film formulation being taken from the group consisting of iron and aluminum, iron and gallium, iron and indium, iron and scandium, iron and titanium, iron and vanadium, iron and chromium, and iron and manganese.

3,946,125

METHOD FOR INTERNALLY COATING DUCTS WITH SYNTHETIC RESIN

Werner Scheiber, Frankfurt am Main, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 191,940, Oct. 22, 1971, Pat. No. 3,869,300. This application May 28, 1974, Ser. No. 474,081

Claims priority, application Germany, Oct. 24, 1970, 2052314; Dec. 3, 1970, 2059548; Sept. 4, 1971, 2144342; Sept. 4, 1971, 2144377

The portion of the term of this patent subsequent to Mar. 4, 1992, has been disclaimed.

Int. Cl.² B05D 3/02, 7/22, 5/00

U.S. Cl. 427—46 2 Claims

1. A method of internally coating an elongated iron or steel pipe, comprising the steps of:

a. clamping said pipe between seals and incorporating it in a closed gas-circulating system;

b. relatively displacing said pipe in a first direction through an induction coil to heat said pipe along the inner surface thereof;

c. sweeping a gas stream along said heated surface;

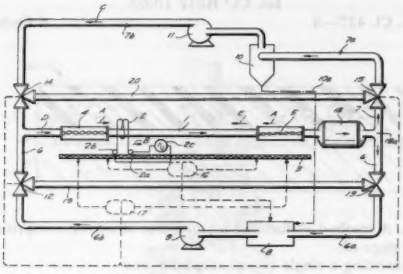
d. charging said gas stream with particles of a synthetic resin flowable at an elevated temperature, said particles having a particle size of 5 to 300 microns and being charged into said gas stream at a rate of up to 2000 g/m^3 (STP) thereof whereby said gas stream entrains said particles and said particles are fritted to said inner heated surface;

e. cooling said gas stream upon its emergence from said inner heated surface;

f. recharging said cooled gas stream by metering additional synthetic-resin particles at substantially the same rate at which said particles are fritted to said inner heated surface;

g. recirculating said recharged cooled gas stream into contact with said inner heated surface to frit additional synthetic-resin particles onto said surface;

h. separating excess resin particles nonadherent to said surface from said gas stream upon its emergence from



contact with said inner heated surface to form a particle-free gas stream;

i. cooling said particle-free gas stream;

j. recirculating said cooled particle-free gas stream while simultaneously induction-heating said pipe with said coil to effect coalescence of said resin particles fritted to said inner surface by relatively displacing said pipe and said coil in the opposite direction to the movement in step (b); and

k. cooling said resin-coated pipe to room temperature.

3,946,126

METHOD OF ELECTROLESS NICKEL PLATING

Nathan Feldstein, Kendall Park, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 778,105, Nov. 22, 1968, abandoned. This application Apr. 21, 1972, Ser. No. 246,474

Int. Cl. C23c *3/02*

U.S. Cl. 427—283 **1 Claim**

1. A method of depositing nickel electrolessly on the metallic surfaces only of an assembly comprising a ceramic and conducting portions made of an alloy of molybdenum and manganese, said method comprising:

treating said assembly with a bath, at 40°C or higher, which contains:

a nickel salt	10 – 50 g/L
a pyrophosphate	10 – 100 g/L
ammonium hydroxide	5 – 40 cc/L (58% by wt. solution)
dimethylamine borane	0.1 – 3 g/L.

3,946,127

LAMINATED STRUCTURAL ARTICLE WITH CONSTITUENT ELEMENTS HAVING INHERENT FRACTURE ARRESTMENT CAPABILITY

James R. Eisenmann; Ben E. Kaminski, and Max E. Waddoups, Jr., all of Fort Worth, Tex., assignors to General Dynamics Corporation, Fort Worth, Tex.

Filed Dec. 4, 1972, Ser. No. 312,043

Int. Cl.[2] **B32B** *3/10*

U.S. Cl. 428—48 **24 Claims**

1. A heterogeneous tape-like composite strip having horizontally coplanar portions differing in modulus of elasticity for forming structural laminates having high crack propagation arrestment characteristics comprising in combination:

a basal tract and at least one fracture barrier tract narrower than said basal tract in coplanar edge-to-edge arrangement therewith to form a heterogeneous tape-like, composite strip,

the basal tract adapted to carry the major portion of a load applied to said strip and the barrier tract forming a marginal area to said basal tract of said strip and acting to arrest propagation of a crack developing in said basal tract and extending to said barrier tract,

each of said tracts being a substantially flat strip containing a plurality of generally parallel reinforcement fibers embedded in a fracture tough resinous polymer matrix,

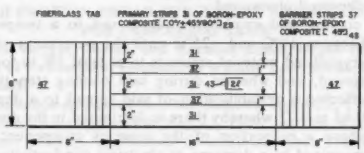
the tracts being disposed in a common horizontal plane and integrally united along their adjoining edges,

the modulus of elasticity of the basal tract fibers being greater than nine million pounds per square inch, and

said basal tract possessing a higher value of modulus of elasticity in the direction parallel thereto than that of the marginal barrier tract in the same direction.

15. A multiply heterogeneous composite structural laminate having high crack propagation arrestment characteristics formed from a plurality of plies one or more of which contains horizontally coplanar portions of differing modulus of elasticity, comprising:

at least one fracture barrier containing primary ply having a plurality of generally parallel high modulus fibers em-



bedded in a polymer matrix and formed from a plurality of substantially flat, strip-like basal tracts and fracture barrier tracts in horizontally coplanar edge-to-edge arrangement therewith;

the basal tracts adapted to carry the major portion of a load applied to said laminate and the barrier tracts being narrower than the basal tracts and disposed marginally to said basal tracts and acting to arrest propagation of a crack developing in one of said basal tracts and extending to an adjacent barrier tract;

the basal and marginal barrier tracts being alternately disposed in their ply in a common horizontal plane and integrally united along their adjoining edges;

said basal tracts possessing a higher value of modulus of elasticity in the direction parallel thereto than that of the marginally adjacent barrier tracts in the same direction; and

the modulus of elasticity of the basal tract fibers being greater than nine million pounds per square inch; and

at least one load distributing secondary ply of generally parallel high modulus reinforcing fibers embedded in a resinous polymer matrix and united in face-to-face relationship to said fracture barrier containing ply, and

said load distributing secondary ply having load-transmitting portions whose modulus of elasticity as measured in the direction of the basal tracts of said first mentioned ply is less than said basal tracts and structurally connect across basal tracts of an adjacent ply for transmitting of loadings therebetween.

3,946,128

LASER ASSEMBLIES USING GLASS DISCS WITH LEAD BORATE COATINGS

Louis Spanoudis, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 13, 1973, Ser. No. 331,754
Int. Cl.² B32B 17/06; C09K 11/08, 11/10; C03C 3/12
U.S. Cl. 428—66 26 Claims

1. A glass laser disc having an annular coating, the coating comprising a lead borate glass capable of absorbing energy at a wavelength of 1.06 microns to thereby absorb parasitic oscillations, the glass coating having an index of refraction not substantially less than the index of refraction of the glass of the laser disc, the thermal expansion and contraction of the coating being sufficiently compatible with the glass laser disc so as to prevent the developement of undesirable strains in the disc, the glass coating comprising PbO, B_2O_3, and an effective energy absorbing amount of a heavy metal oxide that absorbs energy at a wavelength of about 1.06 microns.

3,946,129

PREPARATION OF REPROGRAPHIC SHEETS

David Vernon Hudson Jones, Sevenoaks, England, assignor to Coates Brothers & Company Limited, London, England

Filed June 13, 1973, Ser. No. 369,531
Claims priority, application United Kingdom, June 20, 1972, 28890/72
Int. Cl.² G03G 5/04, 5/08
U.S. Cl. 428—304 11 Claims

1. A process for preparing a reprographic sheet suitable for electrostatographic reproduction comprising (a) providing an electrically relatively conducting substrate, (b) applying to said electrically relatively conducting substrate a composition comprising a film forming material of an electrically relatively non-conducting polymer and an organic liquid mixture comprising at least one solvent for said film forming material and at least one non-solvent for said film forming material, said non-solvent being miscible with and having a lower volatility than that of the other liquids in said mixture, said non-solvent being present in an amount less than that which causes precipitation of the film forming material from the organic liquid mixture, the volume of non-solvent to the volume of non-solvent plus volume of polymer being from 0.35 to 0.65, and (c) removing said organic liquid mixture from said composition applied to said substrate such that substantially all of said solvent for said film forming material is removed before any significant portion of said non-solvent is removed, thereby forming a sheet of said substrate carrying said film forming material, said sheet being a reprographic sheet which possesses the necessary electrical characteristics for use in electrostatographic reproduction.

3,946,130

TRANSPARENT GLASS MICROSPHERES AND PRODUCTS MADE THEREFROM

Chi Fang Tung, Mahtomedi Village, Minn., and James A. Laird, St. Joseph Township, St. Croix County, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 1, 1974, Ser. No. 456,458
Int. Cl.² C03C 3/12; B32B 17/00; C03C 3/30
U.S. Cl. 428—325 12 Claims

1. Essentially colorless transparent glass microspheres that are less than about 2 millimeters in diameter, have an index of refraction between 1.85 and 2.0, contain less than 5 weight-percent of scattered crystallinity, and are at least 95 weight-percent bubble-free, said microspheres being free of alkali oxides, having a uniform index of refraction throughout a sample, and being free-flowing so as to be applicable in a uniform manner, whereby retroreflective products of maximum retroreflectivity are obtained, and said microspheres consisting essentially of between about 20 and 50 weight-percent TiO_2, between about 2.5 and 70 weight-percent of heavy metal oxide selected from BaO and CdO, up to about 35 weight-percent of glass-forming oxide selected from SiO_2, P_2O_5 and GeO_2, and up to about 50 weight-percent of substituents from the table and within the proportions of FIG. 2 of the drawings; the proportions of the constituents in the microspheres defining points within the polygon ABCDEF of FIG. 1 of the drawings.

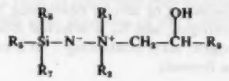
3,946,131

GLASS FIBERS COATED WITH SILICON CONTAINING AMINIMIDE COMPOUNDS

Lawrence P. Biefeld, Toledo; Kevin M. Foley, Hebron, and Frank Paul McCombs, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 6, 1974, Ser. No. 467,313
Int. Cl.² B32B 17/04; C07F 7/18
U.S. Cl. 428—378 13 Claims

1. Glass fibers having a thin size coating thereon, said coating being formed from a compound having the formula



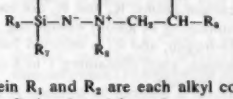
wherein R_1 and R_2 are each alkyl containing 1 to 6 carbon atoms; R_3 is selected from the group consisting of alkyl, aryl, cycloalkyl, alkenyl and acryloxyalkyl and methacryloxyalkyl, R_5 containing 1 to 20 carbon atoms; R_6 and R_7 are each selected from the group consisting of alkoxy containing 1 to 5 carbon atoms, R_5 and hydrogen; and R_8 is selected from the group consisting of hydrogen, alkyl containing 1 to 8 carbon atoms and a group of the formula

$$-CH_2-O-R_4$$

wherein R_4 is selected from the group consisting of phenyl; phenyl substituted with an amino group, a halogen group or an alkyl group; alkyl containing 1 to 20 carbon atoms; alkenyl containing 2 to 8 carbon atoms and a group of the formula

where R′ is hydrogen or methyl.

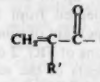
5. A glass fiber bundle formed of a plurality of glass fibers, each of the glass fibers having a thin size coating thereon, said coating formed from a compound having the formula



wherein R_1 and R_2 are each alkyl containing 1 to 6 carbon atoms; R_3 is selected from the group consisting of alkyl, aryl, cycloalkyl, alkenyl and acryloxyalkyl and methacryloxyalkyl, R_5 containing 1 to 20 carbon atoms; R_6 and R_7 are each selected from the group consisting of alkoxy containing 1 to 5 carbon atoms, R_5 and hydrogen; and R_8 is selected from the group consisting of hydrogen, alkyl containing 1 to 8 carbon atoms and a group of the formula

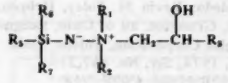
$$-CH_2-O-R_4$$

wherein R_4 is selected from the group consisting of phenyl; phenyl substituted with an amino group, a halogen group or an alkyl group; alkyl containing 1 to 20 carbon atoms; alkenyl containing 2 to 8 carbon atoms and a group of the formula



where R′ is hydrogen or methyl.

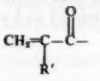
11. In a glass fiber reinforced elastomeric product wherein an elastomeric material constitutes a continuous phase in which the glass fibers are distributed, the improvement in the bonding relationship between the glass fibers and the elastomeric material comprising a coating on the glass fibers, said coating formed from a compound having the formula



wherein R_1 and R_2 are each alkyl containing 1 to 6 carbon atoms; R_3 is selected from the group consisting of alkyl, aryl, cycloalkyl, alkenyl and acryloxyalkyl and methacryloxyalkyl, R_8 containing 1 to 20 carbon atoms; R_6 and R_7 are each selected from the group consisting of alkoxy containing 1 to 5 carbon atoms, R_5 and hydrogen; and R_4 is selected from the group consisting of hydrogen, alkyl containing 1 to 5 carbon atoms and a group of the formula

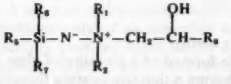
$$-CH_2-O-R_4$$

wherein R_4 is selected from the group consisting of phenyl; phenyl substituted with an amino group, a halogen group or an alkyl group; alkyl containing 1 to 20 carbon atoms; alkenyl containing 2 to 8 carbon atoms and a group of the formula



where R′ is hydrogen or methyl.

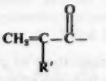
13. In a glass fiber reinforced plastic product wherein a thermosetting or thermoplastic resin constitutes a continuous phase in which the glass fibers are distributed, the improvement in the bonding relationship between the glass fibers and the resin comprising a coating on the glass fibers, said coating formed from a compound having the formula



wherein R_1 and R_2 are each alkyl containing 1 to 6 carbon atoms; R_3 is selected from the group consisting of alkyl, aryl, cycloalkyl, alkenyl and acryloxyalkyl and methacryloxyalkyl, R_8 containing 1 to 20 carbon atoms; R_6 and R_7 are each selected from the group consisting of alkoxy containing 1 to 5 carbon atoms, R_5 and hydrogen; and R_4 is selected from the group consisting of hydrogen, alkyl containing 1 to 8 carbon atoms and a group of the formula

$$-CH_2-O-R_4$$

wherein R_4 is selected from the group consisting of phenyl; phenyl substituted with an amino group, a halogen group or an alkyl group; alkyl containing 1 to 20 carbon atoms; alkenyl containing 2 to 8 carbon atoms and a group of the formula



where R′ is hydrogen or methyl.

3,946,132

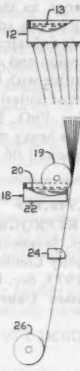
TIRE CORD CONTAINING GLASS FIBERS SIZED WITH A STARCH BASED SIZE

Jerry C. Hedden, Shelby, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 326,740, Jan. 26, 1973, Pat. No. 3,887,389. This application Nov. 29, 1974, Ser. No. 528,362

Int. Cl.² B32B 9/00; C08L 1/00; D02G 3/00

U.S. Cl. 428—378 **4 Claims**



1. In a glass fiber tire cord comprised of sized glass fibers with a coating of an elastomeric latex thereon, the improvement wherein the flex fatigue resistance of said glass fiber tire cord is enhanced by having on the surface of the individual glass fibers a sizing composition consisting essentially of: an aqueous starch mixture consisting essentially of 45 to 55 percent by weight of a high amylose starch component having an amylose content of about 50 to 60 percent by weight, and 45 to 55 percent by weight of a water repellent low amylose starch component having crosslinks therein having an amylose content of about 20 to 30 percent by weight; 0.5 to 3 percent by weight of a member of the group consisting of paraffin wax and microcrystalline wax; 0.4 to 1 percent by weight of a silane coupling agent; and about 0.75 to 1.25 percent by weight of a non-ionic wetting agent.

3,946,133

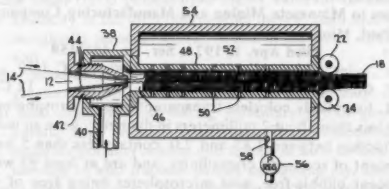
ELONGATED TEXTILE PRODUCT

Roger Vidal, Champagne, and Raymond Gourmandy, Lyon, both of France, assignors to Rhone-Poulenc-Textile SA, Paris, France

Division of Ser. No. 188,775, Oct. 13, 1971, Pat. No. 3,827,113. This application Dec. 21, 1973, Ser. No. 427,344

Int. Cl.² D02G 1/20, 3/02; D04H 17/00

U.S. Cl. 428—400 **2 Claims**



1. A textile product formed of a plurality of texturized, continuous filament, polyamide yarns each having a titre of less than 200 dtex, which are configured into a cylindrical pack having a substantially smooth, continuous peripheral surface, said cylindrical pack having sufficient cohesion to

resist rupture until stressed by a weight in excess of a predetermined weight, said predetermined weight being at least the weight of one meter of the pack when the pack has a specific weight greater than 0.3 grams per cubic centimeter and wherein said yarns composing said pack separate into parallel strands, when said pack is stressed with a force in excess of said predetermined weight but less than a force required to break the yarns.

3,946,134

METHOD OF ENCAPSULATING PARTICLES AND THE RESULTANT PRODUCT

Caryl M. Sherman, Shaker Heights, Ohio, assignor to The Harshaw Chemical Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 381,640, July 23, 1973, abandoned. This application June 4, 1974, Ser. No. 476,245

Int. Cl.² B32B *9/00, 15/02*

U.S. Cl. 428—403 **21 Claims**

1. A process of forming a continuous, dense, protective, adherent skin of a metal phosphate complex on a solid particulate substrate wherein the metal is selected from the group consisting of aluminum and magnesium comprising

a. blending a water soluble basic salt of the metal with an ortho phosphate or a precursor thereof, exclusive of a sodium salt, in an aqueous solution to form a complex thereof, the concentration of the blend being less than about 20 mg/ml of solution,

b. maintaining the solution in a pH range of between about 1 and about 6 for a period of between a few seconds and about 20 minutes in the presence of the particulate substrate to slowly insolubilize the complex and to deposit it as a colloidal sol completely encapsulating the substrate,

c. neutralizing the sol to terminate the formation of the complex, and

d. recovering the encapsulated substrate.

3,946,135

RELEASE COATING COMPOSITION AND RELEASE PAPERS PREPARED THEREFROM

John O. H. Peterson, Cape Elizabeth, Maine, assignor to Scott Paper Company, Philadelphia, Pa.

Filed Nov. 7, 1974, Ser. No. 521,747

Int. Cl.² B32B *9/04*

U.S. Cl. 428—411 **24 Claims**

1. A release coating formulation which comprises a release agent, a monomeric polyhydric alcohol and a cross-linkable, thermosetting resin.

3,946,136

PROCESS FOR CONNECTING SHAPED STRUCTURES CONTAINING POLYTETRAFLUOROETHYLENE

Herbert Fitz, and Franz Mayer, both of Burgkirchen, Alz, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 28, 1974, Ser. No. 446,964

Claims priority, application Germany, Mar. 6, 1973, 2311096

Int. Cl.² B32B *27/32, 27/30, 15/08*

U.S. Cl. 428—422 **6 Claims**

4. A composite structure consisting of shaped structures containing polytetrafluoroethylene connected with themselves or another material stable at a temperature of up to 400°C and an interlayer of at least one copolymer of from 90 to 99.5 % by weight of tetrafluoroethylene and 0.5 to 10 % weight of a perfluoro-alkyl-perfluorovinyl ether of the formula $CF_2 = CF—OR$ wherein R represents a perfluoroalkyl chain having from 1 to 10 carbon atoms, said composite structure being compressed at 320° to 400°C under a pressure of from 0.1 to 20 kg/cm².

3,946,137

MACHINEABLE DECORATIVE LAMINATES

George Edward Power, and Dudley Wulfekotter, both of Cincinnati, Ohio, assignors to Formica Corporation, Cincinnati, Ohio

Filed May 16, 1973, Ser. No. 360,708

Int. Cl.² B44F *1/00*

U.S. Cl. 428—452 **7 Claims**

1. A decorative plastic laminate, provided with improved uniform machineable properties, comprising the heat and pressure consolidated and cured unitary structure of an assembly of superimposed layers comprising:

a. a core portion of unpigmented kraft paper sheets impregnated with a thermosetting phenol-formaldehyde resin, said core portion having a core tool wear index of between about 3 to about 10,

b. at least one white or pastel opaque pigmented alpha-cellulose decorative paper layer impregnated with a thermosetting melamine-formaldehyde resin, having a decor tool wear index of between about 2 to about 7,

c. wherein the pigmented layers having a decor tool wear index greater than 7 or non-pigmented layers having a core tool wear index greater than 10 are present in such a total quantity that they constitute not more than 5% of the total thickness of the laminate.

3,946,138

COMPOSITIONS AND METHODS RELATING TO TRANSFER PROCESSES

Frederick L. Jones, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Apr. 1, 1974, Ser. No. 456,718

Int. Cl.² B32B *27/30, 27/36;* **B41M** *5/02*

U.S. Cl. 428—514 **19 Claims**

1. An image producing transfer element comprising a non-absorbent treated paper, fabric or plastic film base having a coating comprising:

a. a continuous phase comprising a partially hydrolyzed polyvinyl acetate polymer hydrolyzed to the extent of between about 80% and about 95%,

b. a pressure expressible image forming discontinuous phase comprising:

i. at least about 40% by weight of a vehicle comprising at least one C_{12} to C_{20} aliphatic alcohol having an even number of carbon atoms, said vehicle having a freezing point below about 20°C., having dispersed therein

ii. a colorant which is a dye, a pigment or a combination thereof, and wherein the ratio of polymer to the discontinuous phase (*b*) is between about 1:1 and about 1:3.

14. A method of forming a transfer element which comprises coating a non-absorbent base material with an emulsion comprising:

a. a continuous aqueous phase comprising a solubilized partially hydrolyzed polyvinyl acetate polymer, hydrolyzed to the extent of between about 80% and about 95%, having dispersed therein

b. a discontinuous dispersed phase comprising:

i. at least about 40% by weight of a vehicle comprising at least one C_{12} to C_{20} aliphatic alcohol containing an even number of carbon atoms, said vehicle having a freezing point below about 20°C., having dispersed therein

ii. a colorant which is a dye, a pigment or a combination thereof and wherein the ratio of polymer to discontinu-

ous phase (*b*) is between about 1:1 and about 1:3 and drying the resultant coated article.

3,946,139

VINYLIDENE CHLORIDE COPOLYMER LATEXES

Merrill Bleyle, Waltham; William D. DelVecchio, Randolph, and Alex Trofimow, Brookline, all of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Jan. 17, 1974, Ser. No. 434,031

Int. Cl.² B32B *27/08*

U.S. Cl. 428—518 **2 Claims**

1. A laminate comprising at least one layer of unprimed polyolefin film bonded to a vinylidene chloride copolymer coating obtained from a composition comprising an aqueous dispersion of a copolymer which comprises, on a weight basis:

a. about 70 to 95% vinylidene chloride,

b. about 0.5 to 25% of an hydroxyalkyl ester of an alpha, beta-ethylenically unsaturated carboxylic acid having at up to 5 carbon atoms,

c. about 0.1 to 5% 2-acrylamido-2-methylpropane sulfonic acid,

d. about 0.1 to 5% of an ethylenically unsaturated carboxylic acid having up to 5 carbon atoms, and

e. about 1 to 29% of copolymerized ethylenically unsaturated monomer containing no free acid or hydroxyalkyl groups.

3,946,140

ELECTROGRAPHIC RECORDING MATERIAL

Robert Joseph Noe, and Pierre Jean Rutten, both of Mortsel, Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Apr. 12, 1973, Ser. No. 350,394

Claims priority, application United Kingdom, Apr. 13, 1972, 17121/72

Int. Cl.² G03G *5/022*; B32B *27/08*, *27/20*

U.S. Cl. 428—522 **13 Claims**

1. An electrographic recording material comprising a conductive sheet support having a surface resistivity not exceeding about 1×10^{10} ohm/sq. and carried on said support a non-photoconductive insulating layer consisting essentially of about 2–20 gms dry weight per sq.m. of a copolymer of about 50–91% by weight of vinyl acetate, about 8–50% by weight of a vinyl ester of a C_{12-18} fatty acid, and about 0–2% by weight of crotonic acid, and up to 400% by weight of said copolymer of a finely divided non-photoconductive pigment.

3,946,141

COOLING APPARATUS FOR AN ELECTRIC CABLE

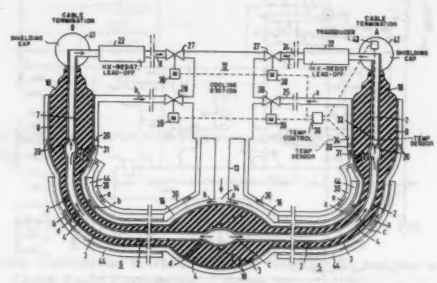
Fritz Schmidt, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 10, 1974, Ser. No. 513,750

Claims priority, application Germany, Oct. 24, 1973, 2353354

Int. Cl.² H01B *12/00, 7/34*

U.S. Cl. 174—11 R 19 Claims



1. Apparatus for cooling an electrical cable, having connectrically arranged inner and outer superconductor conductors at high voltage and zero voltage respectively, to a low temperature, said cable including means at each end terminating said superconductor conductors, each cable termination having concentric inner and outer ordinary conductors, comprising:

a. means dividing the electrical cable into at least two cable sections whereby each cable section will have its ends defined respectively by said means dividing and one of the cable terminations;

b. first coolant stream means for commonly forcing coolant past the inner superconductor conductor of said electrical cable in both of said sections and past each inner ordinary conductor in each of said cable terminations;

c. second coolant stream means for commonly forcing coolant past the outer superconductor conductor of both sections of said electrical cable and past each outer ordinary conductor in said cable terminations;

d. a cooling station for maintaining a supply of coolant;

e. means for applying coolant from said cooling station to said first and second coolant stream means commonly at said means dividing said cable into two cable sections; and

f. return means for returning the coolant to said cooling station after said coolant passes through said superconductor conductors and said ordinary conductors of said cable terminations.

3,946,142

COOLING OF POWER CABLES UTILIZING AN OPEN CYCLE COOLING SYSTEM

Mazin Kellow, 325 Joliette St., Apt. 309, Longueuil J4H 2G6, Quebec; James VanSant, 18 Langevin St., Chambly, Quebec J3L 2G2, and Jacques Bonneville, 2050 Bedford St., St-Bruno, Quebec, J3V 4A8, all of Canada

Filed Sept. 30, 1974, Ser. No. 510,658

Int. Cl.² H01B *7/34*

U.S. Cl. 174—15 C 6 Claims

1. An underground power cable system comprising:

a. a plurality of elongated, closed chambers arranged sequentially in substantially end-to-end relationship;

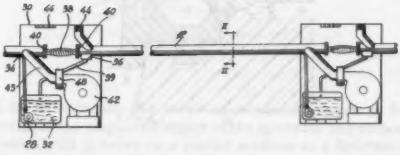
b. a plurality of stations, one station being disposed between each pair of adjacent ends of elongated chamber pairs;

c. a reservoir in each station, each reservoir having a supply of water therein;

d. a pump in each station, said pump communicating both with said reservoir and one of said elongated chambers;

e. each elongated chamber having at least one electrical power cable passing therethrough and having a first portion defining a first passageway for liquid water, said first passageway extending along the entire length of said chamber, each chamber also having a second portion defining a passageway for water vapor, said second passageway extending along the entire length of said chamber;

f. means, comprising a layer of porous material surrounding said cable, for distributing water by drawing liquid from said first passageway by capillary action and thereby



providing uniform wetting of a surface of said distributing means, said power cable and distributing means intersecting both said first and said second passageways;

g. means connected with each elongated chamber for forcibly moving water vapor from said enclosed chamber to the atmosphere;

h. whereby water drawn from said first passageway by said distributing means is evaporated into said second passageway to cool the power cable, and the water vapor thus formed is moved downstream through said elongated chamber by moving means and is heated by said cable to further increase evaporation and to cool the downstream portion of the cable.

3,946,143

HEAT RECOVERABLE ARTICLE FOR PROTECTING JUNCTIONS

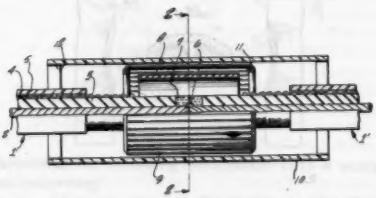
Robert H. McLoughlin, Swindon, England, assignor to Raychem Limited, London, England

Filed Sept. 9, 1974, Ser. No. 504,375

Claims priority, application United Kingdom, Sept. 10, 1973, 42483/73

Int. Cl.² H02G *15/08*

U.S. Cl. 174—84 R 11 Claims



10. An article comprising a dimensionally unstable hollow member capable of recovering toward an original dimension, and a sheath having generally longitudinal corrugations disposed within said member, said corrugations being collapsible by recovery of said member toward said original dimension.

3,946,144

SEALED CABLE JUNCTION

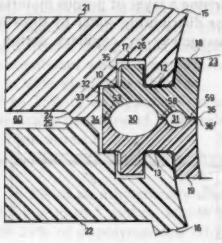
Hermann Quante, Wuppertal, Germany, assignor to Wilhelm Quante Spezialmaschinenfabrik fur Apparate der Fernmeldetechnik, Wuppertal, Germany

Filed June 26, 1974, Ser. No. 483,440

Claims priority, application Germany, June 28, 1973, 2332847

Int. Cl.² H02G 15/08

U.S. Cl. 174—92 14 Claims



1. A sealed cable junction sealing a splice connection between cables, comprising a longitudinally subdivided housing having two connected shell sections which together surround an interior splicing chamber wherein spliced-together cable end portions are located; a pair of shell inserts of fluid-impermeable material accommodated in said housing and having respective outwardly projecting juxtaposed marginal flanges which are jointly formed with a longitudinal channel bounded at its opposite lateral sides by respective juxtaposed surface portions of said flanges; a strand of sealing material accommodated in compressed state in said channel; and at least one auxiliary passage formed in said juxtaposed surface portions and adapted to accommodate sealing material that might be squeezed out of said channel.

3,946,145

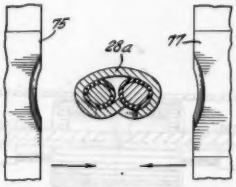
TERMINATED WIRES AND METHOD OF MAKING THE SAME

Samuel Warner, 1233 St. George St., West, Linden, N.J. 07036

Division of Ser. No. 290,244, Sept. 19, 1972, Pat. No. 3,793,503. This application Dec. 10, 1973, Ser. No. 423,293

Int. Cl.² H02G 15/08

U.S. Cl. 174—94 R 6 Claims



1. A method of electrically connecting two or more wires comprising forming a terminal about the wires elongating the terminal and wire in one direction, applying heat and current to the terminal and wires causing softening of the same, applying pressure to the softened terminal and wires fusing the contacting surfaces thereof and elongating a portion of the terminal and wire in a direction generally perpendicular to said one direction.

3,946,146

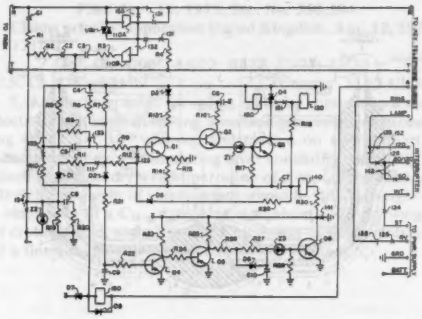
DISCRETE RINGING DETECTOR FOR USE IN KEY TELEPHONE SYSTEMS

Wallace G. Brown, and Thomas C. Lloyd, both of Bloomington, Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jan. 17, 1975, Ser. No. 541,832

Int. Cl.² H04M 1/00

U.S. Cl. 179—99 8 Claims



1. A key telephone line circuit adapted for connection between a branch telephone exchange and at least one key telephone subset including signaling means, said line circuit further connected to a source of first and second signals and including ring detection means operable in response to incoming signals from said branch exchange representing a call originating in said branch telephone exchange to connect said first signals from said signal source to said key telephone signaling means whereby said signaling means are operated in a first distinctive mode and operable in response to incoming signals from said branch exchange representing a call originating outside said branch telephone exchange to connect said second signals from said signal source to said signaling means, whereby said signaling means are operated in a second distinctive mode, said ring detection means comprising: switching means normally completing a circuit path for said first signals from said signal source to said signaling means; and timing means connected between said branch exchange and said switching means operated in response to incoming signals received from said branch telephone exchange in excess of a predetermined minimum duration to operate said switching means to break said signal source first signal circuit path to said signaling means and complete a circuit path for said signal source second signals to said signaling means.

3,946,147

MAGNETIC RECORDING SYSTEM

Marvin Camras, Glencoe, Ill., assignor to IIT Research Institute, Chicago, Ill.

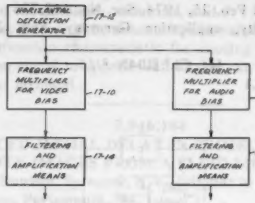
Continuation of Ser. No. 347,649, April 4, 1973, abandoned. This application Mar. 26, 1975, Ser. No. 562,145

Int. Cl.² H04N 5/78

U.S. Cl. 178—5.6 6 Claims

1. In a video transducer system comprising a magnetic transducer head for scanning cooperation with a magnetic record medium, a video recording circuit connected with said transducer head during recording operation for supplying a video signal to be recorded to said transducer head and for producing a video signal magnetic field acting on the record medium to record the video signal thereon, and a high frequency bias circuit connected with said transducer head during recording operation for producing a high frequency bias magnetic field which is superimposed on the video signal magnetic field to assist in the recording of the video signal,

wherein the improvement comprises means determining the bias frequency of said high frequency bias magnetic field so as

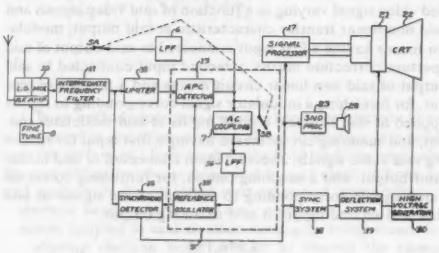


to avoid beat notes with frequency components of the video signal.

3,946,148
TELEVISION RECEIVER OPERABLE IN EXACT OR EXTENDED RANGE TUNING MODES

Peter Constantine Skerlos, Arlington Heights, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Oct. 3, 1974, Ser. No. 511,855
Int. Cl.² H04N 5/50
U.S. Cl. 178—5.8 AF **3 Claims**



1. A television receiver comprising:

a voltage controllable tuner, including a variable frequency local oscillator, converting a received modulation bearing signal to an intermediate frequency signal;

modulation recovery means including variable frequency oscillation means producing a reference carrier, a synchronous detector, responsive to said reference carrier and said intermediate frequency signal, recovering said modulation, and discriminating means, operative upon said variable frequency oscillation means, comparing said reference carrier to said intermediate frequency signal and generating a feedback control signal having AC and DC components;

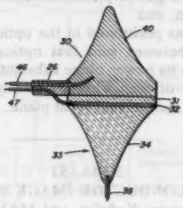
said television receiver operable in a first mode in which the frequency of said local oscillator is determined by said variable frequency oscillation means or in a second mode in which the frequency of said variable frequency oscillation means is determined by said local oscillator; and

mode selection means, permitting operation of said television receiver in either said first or said second mode, including means, operable in said first mode, separating said AC and DC components of said feedback control signal and supplying said DC components to said local oscillator and said AC components to said variable frequency oscillation means, and means, operable in said second mode, supplying said DC and AC components exclusively to said variable frequency oscillation means.

3,946,149
APPARATUS FOR EMBOSSING INFORMATION ON A DISC

James V. White, New York, N.Y., assignor to CBS Inc., New York, N.Y.

Filed Oct. 24, 1974, Ser. No. 517,530
Int. Cl.² H04R 17/06; H01L 23/ 4
U.S. Cl. 178—6.6 B **4 Claims**



1. In an apparatus for receiving electronic signals at frequencies in the megahertz region of the spectrum and embossing modulated grooves on a carrier medium as a function of the received signals, said apparatus including means for supporting an embossing assembly and said carrier medium in spaced relationship and means for causing relative motion as between said carrier medium and said embossing assembly; an embossing assembly comprising:

a wafer of piezoelectric material affixed to said supporting means;

means for applying said electronic signal across said wafer;

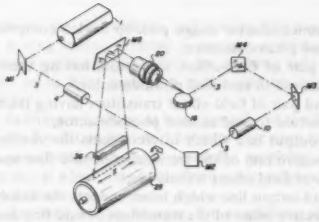
a horn-shaped tapered stylus member having a relatively blunt end coupled to one side of said wafer and tapering to a relatively pointy stylus end, said stylus end being positionable in contact with said medium; and

a horn-shaped load member affixed to the other side of said wafer.

3,946,150
OPTICAL SCANNER

David Grafton, Santa Monica, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 20, 1973, Ser. No. 426,882
Int. Cl.² H04N 1/22
U.S. Cl. 178—6.7 R **11 Claims**



1. Apparatus for recording information onto a scanned medium comprising:

laser means for generating a collimated beam of radiation,

means for modulating the beam in accordance with the information content of an electrical signal,

first optical means for imaging said modulated beam to a spot in a focal plane at the surface of said medium, said medium being sensitive to said radiation beam,

scanning means positioned between said laser means and said medium for scanning the spot across said medium to

impart the information content of said spot to said medium,

second optical means positioned between said laser means and said scanning means for focusing said beam to a predetermined spot size, said second optical means comprising first and second cylindrical lens elements, said first cylindrical lens element being positioned with its power plane substantially orthogonal to the scan direction and said second cylindrical lens element being positioned with its power plane substantially parallel to the scan direction, and

a cylindrical lens positioned in the optical path of the imaged beam between said first optical means and said medium with its power plane substantially orthogonal to the direction of scan whereby said beam is focused to maintain the spot in said focal plane.

3,946,151

SEMICONDUCTOR IMAGE SENSOR

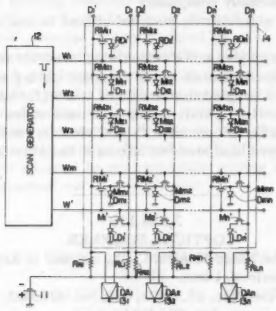
Takamitsu Kamiyama, Kodaira, and Mikio Ashikawa, Koganei, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 14, 1974, Ser. No. 442,639

Claims priority, application Japan, Feb. 14, 1973, 48-17454

Int. Cl.² H04N 3/16

U.S. Cl. 178—7.1 **23 Claims**



1. A semiconductor image pick-up device comprising: first and second photodetectors;

a first pair of field-effect transistors having their sources connected to said first photodetector;

a second pair of field-effect transistors having their sources connected to said second photodetector;

a first output line which interconnects the drains of each respective one of the transistors of said first and second pairs of field-effect transistors;

a second output line which interconnects the drains of each respective other of the transistors of said first and second pairs of field-effect transistors;

an input line which interconnects the gate of the one transistor of said first pair of transistors to the gate of the other transistor of said second pair of transistors;

first circuit means which is connected to said first and second output lines for generating a signal representative of the difference of signals appearing on said first and second output lines; and

second circuit means for applying a signal readout pulse to said input line when said first photodetector has no optical input stored therein.

3,946,152

CORRECTION SYSTEM FOR VIDEO SIGNALS HAVING A LIMITED AMPLITUDE RANGE

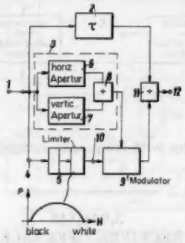
Gerhard Illetschko, Liebigstr. 51, 61 Darmstadt, and Horst Peth, Jugenheimer Str. 49, 6246 Alsbach, both of Germany

Filed Feb. 25, 1974, Ser. No. 445,776

Claims priority, application Germany, Feb. 28, 1973, 2309884

Int. Cl.² H04N 3/16

U.S. Cl. 178—7.1 **7 Claims**



1. In an aperture correction system including aperture correction means having an input for receiving video signals and an output for furnishing aperture correction signals varying as a function of said video signals, an additional correction system comprising, in combination, non-linear circuit means having an input for receiving said video signals, a non-linear transfer characteristic, and an output, for furnishing a modified video signal varying as a function of said video signals and said non-linear transfer characteristic at said output; modulator means having a first input connected to said output of said aperture correction means, a second input connected to said output of said non-linear circuit means and a modulator output, for furnishing a modulator signal corresponding to signals applied at said first and second inputs at said modulator output; and summing circuit means having a first input for receiving said video signals, a second input connected to said modulator output, and a summing output, for furnishing corrected video signals corresponding to the sum of the signals at said first and second inputs at said summing output.

3,946,153

SYSTEM FOR PRODUCING A CORRECTION SIGNAL FOR THE APERTURE CORRECTION OF VIDEO SIGNALS

Horst Peth, Alsbach, and Gerhard Illetschko, Darmstadt, both of Germany, assignors to Robert Bosch Fernsehanlagen GmbH, Darmstadt, Germany

Filed May 3, 1974, Ser. No. 466,820

Claims priority, application Germany, May 25, 1973, 2326620

Int. Cl.² H04N 5/197

U.S. Cl. 178—7.1 **8 Claims**

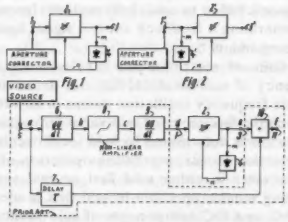


Fig. 1 Fig. 2

1. A system for producing an output correction signal for aperture correction of video signals, comprising:

A. a video amplifier having a controllable amplification characteristic and input and output terminals,

B. an aperture corrector for supplying to the input terminal of the amplifier a correction signal which is dependent upon the time derivative of the video signal from a video source to be corrected,

C. means for detecting peak values of correction signals at one of the amplifier terminals, and

D. means for using the detected peak values to control said amplification characteristic for causing the output correction signal to appear with a constant amplitude at the output terminal.

3,946,154

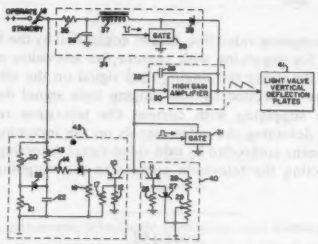
REDUCED INITIAL DELAY IN PROJECTING HIGH QUALITY IMAGES FROM A FLUID LIGHT VALVE

Alfred G. Roussin, Syracuse, N.Y., assignor to General Electric Company, Portsmouth, Va.

Filed Mar. 22, 1974, Ser. No. 453,779

Int. Cl.² H04N 3/16

U.S. Cl. 178—7.5 D **24 Claims**



1. In an optical projection system wherein an electron beam is deflected in accordance with a signal to impinge in a raster over the surface of a light-modulating fluid medium, apparatus for controlling the charge deposited by said electron beam on said medium during an initial start-up period, comprising:

electron beam generating means, and

means coupled to said electron beam generating means for altering electron beam current to control the charge density throughout said raster so as to sweep out excess fluid from the raster area until said medium reaches operating condition.

3,946,155

OPTICAL SCANNING SYSTEMS

John Kenneth Houston, Glasgow, and Andrew Simpson Winter, Hardgate, both of Scotland, assignors to Barr and Stroud Limited, Glasgow, Scotland

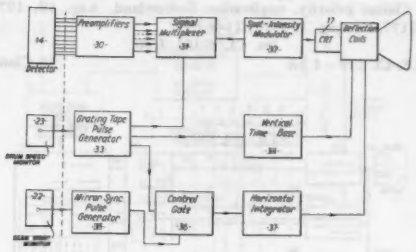
Filed Sept. 5, 1974, Ser. No. 503,917

Claims priority, application United Kingdom, Oct. 18, 1973, 48482/73

Int. Cl.² H04N 7/18

U.S. Cl. 178—7.6 **6 Claims**

1. An optical scanning system comprising a scanning head incorporating a linear array of radiation-detecting elements, a rotatable member arranged to scan radiation entering the head along a predetermined line of sight across the said array, and a visual display system coupled to the output of the array, said visual display system incorporating a signal multiplexer coupled sequentially to sample the signal outputs of the detecting elements in the array, and a scanned raster device having a spot-intensity modulator coupled to the output of the multiplexer, the raster for said device being generated by first and second time bases of which the first time base provides movement of the spot in a first direction corresponding to the longitudinal axis of the linear array of detecting elements and is gated to operate in synchronism with the signal multiplexer and the rotatable member cooperates with synchronizing means coupled to control the second time base to move the



spot in a second direction at a rate determined by the speed of rotation of the rotatable member.

3,946,156

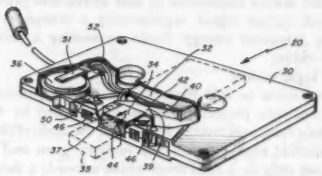
ADAPTER FOR RECORDING-REPRODUCING MACHINE

Charles R. Budrose, Box 1057, Saugus, Mass. 01906

Filed Oct. 29, 1974, Ser. No. 518,261

Int. Cl.² G11B 31/00

U.S. Cl. 179—1 AT **11 Claims**



1. A device for use with an audio recording-reproducing maching having means defining a cassette receiving station and a transducer head, said device for enabling said machine to operate as at least part of a public address system and comprising;

means defining a housing at least partially in the form of a cassette for fitting into said cassette receiving station,

means associated with the housing for receiving an audio input signal which may come from a microphone or other input device,

means disposed in the housing for amplifying the audio signal,

a self-contained active source of DC power disposed in the housing,

means for selectively coupling the source of DC power to the amplifier means,

a transducer means disposed in the housing in juxtaposition to said transducer head of the machine,

and means for coupling the amplified audio signal to the transducer means,

said transducer means coupling the signal to the transducer head of the machine.

3,946,157
SPEECH RECOGNITION DEVICE FOR CONTROLLING A MACHINE

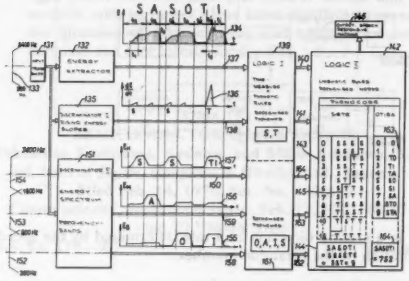
Jean Albert Dreyfus, 5 Avenue de la Grenade, Geneva, Switzerland

Continuation-in-part of Ser. No. 280,723, Aug. 14, 1972, abandoned. This application Aug. 9, 1974, Ser. No. 496,326

Claims priority, application Switzerland, Aug. 18, 1971, 12177/71; Aug. 1, 1972, 11462/72

Int. Cl.² G10L 1/00

U.S. Cl. 179—1 SA **16 Claims**



1. A speech recognition apparatus for controlling a machine, said apparatus receiving words, said words being classified in a reduced plurality of three through twelve phoneme classes, said apparatus including:

a. input means for receiving said words;

b. first means responsive to said words indicating short-time energy values of said words, said first means producing a first output signal representing rising temporal energy flanks (slopes), nearly constant energy levels and zero levels of said words;

c. second means responsive to said words and producing a second output signal representing a steepness of said rising temporal energy flanks exceeding a determined limit value;

d. first logic means

i. responsive to said first output signal segmenting said words into phonetic elements, indicated by both the rising temporal energy flanks and the ends of the nearly constant energy levels and indicating an end of each word only by a zero level which exceeds a determined value of time duration producing a third output signal,

ii. responsive to said second output signal separating a class of the plosive phonetic elements from the class of the fricative phonetic elements and producing a fourth output signal,

e. second logic means detecting a sequence of the occurrence of said phonetic elements within one word; and

f. output means for controlling a machine as a result of the detected words.

3,946,158
VIDEO-TELEPHONE SYSTEM INITIALLY SIGNIFIES CALLER TO CALLED SUBSCRIBER

Marc A. Leclercq, Ecole Lafontaine, voie due Bon Puits, Wissous, France (92320); Alain M. Poirier, 82, rue de la Republique, Meudon, France (92190), and Jacques M. Guichard, 42, rue Gerard, Paris, France (75013)

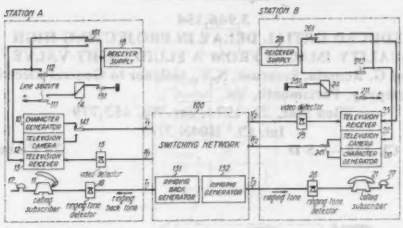
Filed Apr. 25, 1975, Ser. No. 571,700

Claims priority, application France, Apr. 26, 1974, 74.14599

Int. Cl.² H04M 11/08

U.S. Cl. 179—2 TV **3 Claims**

1. In a video-telephone system comprising a switching network and subscriber stations each including a telephone handset and an associated audio bell actuated by a ringing tone signal, a television camera, a television receiver and a character generator, and connected to said switching network by a bidirectional telephone line and by an incoming and outgoing unidirectional video line conveying video signals, the improvement allowing a called subscriber to receive on his television receiver, before he has taken off his telephone handset, characters transmitted by a calling subscriber, the said improvement comprising in each subscriber stations means controlled by the handset taking off for connecting the character generator to the outgoing video line, means controlled by the handset taking off for supplying with current the television camera, means for detecting the ringing tone signal on the telephone line, means controlled by said ringing tone signal detecting means for supplying with current the television receiver, means for detecting the video signals on the incoming video line and means controlled by said video signal detecting means for connecting the television camera to the outgoing video line.



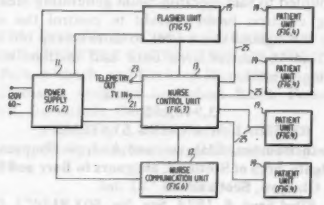
3,946,159
HOSPITAL COMMUNICATION SYSTEM

James P. Fay, Ranchester, Wyo., assignor to Vital Signs, Incorporated, Ranchester, Wyo.

Continuation of Ser. No. 344,361, March 23, 1973, abandoned. This application June 20, 1975, Ser. No. 588,640

Int. Cl.² H04M 11/06

U.S. Cl. 179—2 TV **14 Claims**



13. A communication system suitable for use in a hospital and the like to provide communication between patients and a central nurse station, said communications system comprising:

a nurse unit including,

a microphone,

a video transmitting means having a camera which may be directed toward a nurse at said nurse station, and,

a control means;

a plurality of patient units each including a television receiver having audio reception means and patient controlled volume control means; and,

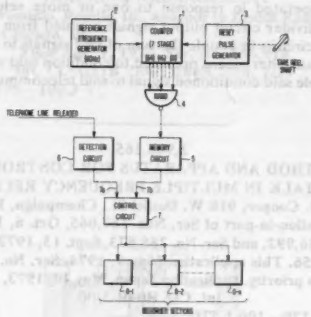
a coaxial cable interconnecting said nurse unit with each said patient station for transmitting, video, audio and control signals from said nurse unit to said television receivers,

said control means disabling the patient controlled volume control means when connecting said microphone means to said audio reception means.

3,946,160
TELEPHONE ANSWERING DEVICE WITH PLURAL MESSAGE RECORDING TAPES

Shizuo Ando, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 19, 1975, Ser. No. 551,227
Claims priority, application Japan, Feb. 19, 1974, 49-19678
Int. Cl.[2] G11B *15/06*; H04M *1/64*
U.S. Cl. 179—6 R **3 Claims**



1. An automatic telephone-answering and message-recording apparatus adapted to be connected to a telephone line and comprising:

a plurality of recording tape media selectively connectable to the telephone line for recording incoming messages received over the telephone line, each tape medium being fed from a supply reel to a take-up reel during a recording operation;

reference signal generator means for generating a reference signal having a constant frequency;

counter means coupled to said generator means for counting the cycles of said reference signal;

reset pulse generator means for generating reset pulses for said counter means at intervals proportional to the rotational speed of one of the reels during a recording operation;

detector means coupled to said telephone line for producing a release signal upon the cessation of incoming messages being recorded or the pass of predetermined operation time period during a recording operation on a first of said recording media; and

control means connected to said plurality of recording tape media, and responsive to a coincidence of said release signal and a predetermined count in said counter means, for switching subsequent incoming messages from said first recording medium to a second of said recording media.

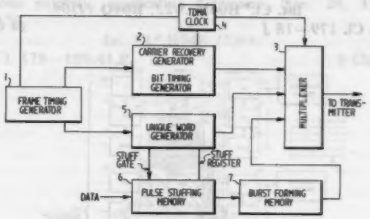
3,946,161
DISTRIBUTED BIT STUFF DECISION TRANSMISSION

John M. Husted, Vienna, Va.; Ova Gene Gabbard, Germantown, and William G. Schmidt, Rockville, both of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Oct. 26, 1970, Ser. No. 84,105
Int. Cl. H04j *3/06*
U.S. Cl. 179—15 AF **4 Claims**

1. In a time division multiplexed (TDM) communications system wherein the incoming data rate differs from the TDM information rate and wherein the data to be transmitted is formed in bursts a method for transmitting the decision to stuff comprising the steps of:

a. generating the complement of a stuff decision code word in response to a decision to stuff or the nocomplement of a stuff decision code word when there is no decision to stuff;



d. distributing said code word over a number of frames in a burst from one station;

c. transmitting said distributed code word;

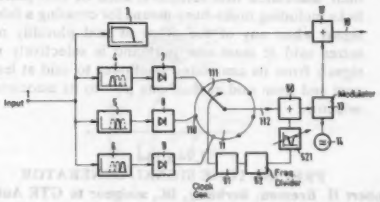
d. receiving said distributed code word; and

e. detecting either the complement or the noncomplement of the distributed stuff decision code word.

3,946,162
SYSTEM FOR TRANSFERRING WIDEBAND SOUND SIGNALS

Gerhard-Gunter Gassman, Berkheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 17, 1974, Ser. No. 470,880
Claims priority, application Germany, June 4, 1973, 2328316; June 4, 1973, 2328317
Int. Cl.[2] H04J *3/00*; G10L *1/00*
U.S. Cl. 179—15.55 R **10 Claims**



1. A receiver for use in a system having a transmitter of the type that transfers lower frequency range sound signals directly and at least one pilot frequency signal modulated by an amplitude signal corresponding to the amplitude of the sound signals in a higher frequency range, said receiver comprising:

means for receiving and demodulating the pilot frequency signal to provide an amplitude signal corresponding to the amplitude of the signal in the higher frequency range;

means for providing an equivalent signal having a frequency approximately equal to the mid range frequency of the higher frequency range;

means for modulating the equivalent signal with the amplitude signal to provide a synthetic signal;

means for dividing the synthetic signal into a pair of quadrature signals;

first and second means for providing noise signals;

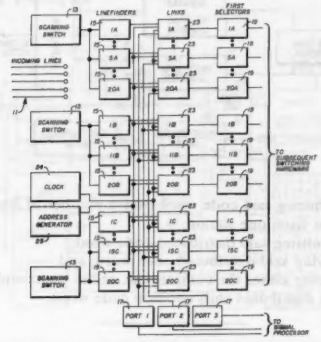
first and second means for modulating the pair of quadrature signals with the noise signals;

means for receiving and reproducing the noise modulated quadrature signals and the directly transferred lower frequency range sound signal.

3,946,163
PORT MULTIPLEXER FOR TELEPHONE SIGNAL PROCESSING SYSTEMS

Daniel Richard Asmussen, Kirkland, and Barry Cameron Breen, Redmond, both of Wash., assignors to Tel-Tone Corporation, Kirkland, Wash.

Filed Mar. 17, 1975, Ser. No. 559,032
Int. Cl.² H04M *3/22*; H04Q *11/04*
U.S. Cl. 179—18 J **14 Claims**



1. A port multiplexer suitable for use in a telephone signal processing system to couple telephone lines to a signal processor comprising:

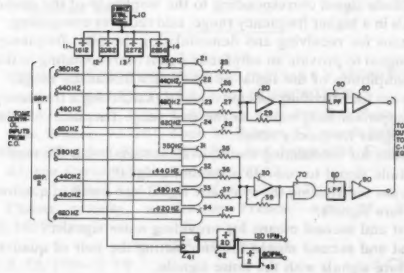
at least one port suitable for converting telephone signals into a form suitable for receipt by a signal processor; and,

a plurality of links, each suitable for connection between an associated linefinder and first selector of a telephone system, said plurality of links being connected to said at least one port for seizing said at least one port and selectively routing signals from their associated linefinders to said at least one port and from said at least one port to their associated first selectors, each of said plurality of links including make-busy means for creating a false busy signal when any of the other of said plurality of links seizes said at least one port and is selectively routing signals from its associated linefinder to said at least one port and from said at least one port to its associated first selector.

3,946,164
PRECISE TONE SIGNAL GENERATOR

Robert H. Beeman, Berkeley, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 28, 1974, Ser. No. 473,851
Int. Cl.² H04M *19/02*
U.S. Cl. 179—84 VF **10 Claims**

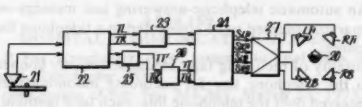


1. Tone signal generating means operable to generate selected tone signals for use in an associated telecommunication system comprising: an oscillator circuit operated to generate signals at a first frequency; a plurality of different frequency divider circuits each connected to said oscillator circuit and each operated in response to said oscillator circuit output signals to generate different output signals at frequencies different than that of said oscillator circuit; at least one summing circuit; a plurality of tone selector circuits each including a first input connected to a different one of said frequency divider circuits, a second input connected to selection circuitry of said telecommunications system and an output connected to said summing circuit, selectively operated in response to a signal from said telecommunication system selection circuitry to couple said selected connected frequency divider circuit output signals to said summing circuit; first filter means connected between said summing circuit and the output of said tone signal generating means; said summing circuit operated in response to one or more selected frequency divider circuit output signals coupled from said tone selector circuits to couple the sum of said signals to said filter means; said filter means operated to condition said sum signal and couple said conditioned signal to said telecommunications system.

3,946,165
METHOD AND APPARATUS FOR CONTROL OF CROSSTALK IN MULTIPLE FREQUENCY RECORDING

Duane H. Cooper, 918 W. Daniel St., Champaign, Ill. 61820

Continuation-in-part of Ser. Nos. 187,065, Oct. 6, 1971, Pat. No. 3,856,992, and Ser. No. 288,873, Sept. 13, 1972, Pat. No. 3,906,156. This application May 9, 1974, Ser. No. 468,279
Claims priority, application Japan, May 10, 1973, 48-52076
Int. Cl.² H04R *5/00*
U.S. Cl. 179—100.1 TD **13 Claims**



1. Apparatus for recording 4-channel signals as main channel and frequency modulated subchannel signals on two groovewalls of a recording disc with compensation for main channel to subchannel crosstalk resulting from playback tracing distortion, comprising

matrixing means for providing first and second main channel signals and first and second subchannel signals, said matrixing means having directional coefficients of differing amplitude and phase characteristics for providing differing linear combinations of directional audio signals for encoding at least three of the audio signals in each of said main channel and said subchannel signals,

first main channel input means for said first main channel signal,

second main channel input means for said second main channel signal,

first subchannel input means for said first sub-channel signal to be recorded on a first recording disc groovewall with said first main channel signal,

second subchannel input means for said second subchannel signal to be recorded on a second recording disc groovewall with said second main channel signal,

first subtracting means for subtracting a predetermined amount of said first main channel signal from said first subchannel signal to provide a first compensated subchannel signal,

second subtracting means for subtracting a predetermined amount of said second main channel signal from said second subchannel signal to provide a second compensated sub-channel signal,

means for angularly modulating a carrier signal with said first and second compensated subchannel signals to provide a first angularly modulated subchannel signal and a second angularly modulated subchannel signal,

means for adding said first angularly modulated signal and said first main channel signal to provide a recording signal for said first groovewall,

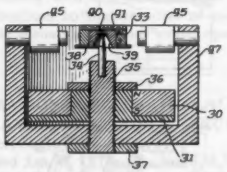
means for adding said second angularly modulated subchannel signal and said second main channel signal to provide a recording signal for said second groovewall, and

recording means for recording said first and second recording signals on the first and second groovewalls of a recording disc.

3,946,166
TRACKING ARRANGEMENT

Karl H. Wossidlo, Roselle, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Apr. 1, 1974, Ser. No. 456,918
Int. Cl.² G11B 7/00; H04N 5/86, 1/24
U.S. Cl. 179—100.3 V **4 Claims**



1. In an optical image-reproducing system in which program information stored in a generally circular track is derived by reading the track with a beam of optical energy and in which a pair of tracking correction signals is developed related to the radial tracking and timing relationships, respectively, of said beam relative to said track, an improved tracking arrangement which comprises:

a first ring-shaped, axially poled magnet;

a second axially-poled magnet having a pivot bearing associated therewith and poled in the same direction as said first magnet;

support means comprising a pivot support pin mating with said pivot bearing for pivotally positioning said second magnet coaxially with and in such proximity to said first magnet as to magnetically captivate said bearing against said support pin while permitting tilting displacement of said second magnet with respect to two orthogonally related axes;

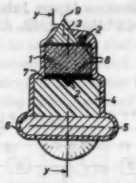
a mirror disposed in the path of said beam and mechanically coupled to said second magnet for concurrrent displacement therewith; and

a pair of electromagnetic means individually positioned along an assigned one of said axes in close proximity to said second magnet and individually responsive to an assigned one of said correction signals to develop a magnetic field, having a magnitude and direction determined by the amplitude and polarity of the applied signal, for reacting with the field of said second magnet to effect controlled displacement of said mirror with respect to the associated one of said axes.

3,946,167
HIGH DENSITY RECORDING PLAYBACK ELEMENT CONSTRUCTION

Bodo Schultz, Berlin, Germany, assignor to TED Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec, Zug, Switzerland

Filed Nov. 19, 1974, Ser. No. 525,312
Claims priority, application Germany, Nov. 20, 1973, 7341378
Int. Cl.² H04R 17/04
U.S. Cl. 179—100.41 P **8 Claims**

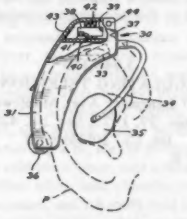


1. In a pickup for a high density signal recording including a mechanical-electrical pressure transducer and a scanning element fastened thereto and presenting a scanning surface, the improvement comprising a layer of a hardened casting mass forming a coating on that part of the surface of said pickup where said pressure transducer is connected to said scanning element, said mass being of a material which, in the liquid state prior to becoming hardened, has a viscosity of from 5 to 50 cP.

3,946,168
DIRECTIONAL HEARING AIDS

David A. Preves, Minneapolis, Minn., assignor to Maico Hearing Instruments Inc., Kent, Wash.

Filed Sept. 16, 1974, Ser. No. 506,253
Int. Cl.² H04R 25/02
U.S. Cl. 179—107 FD **5 Claims**



1. A miniature hearing aid unit to be worn on a person's head, comprising;

a miniature housing having means to be fitted to a side of a person's head adjacent an ear to be carried thereon in predetermined orientation relative to the front of the person's head, the housing having an inner side to face the person's head and an outer side facing away from the head and the housing also having an interior microphone chamber;

a directional microphone within said microphone chamber and having spaced fore and aft ports respectively admitting sounds to opposite sides of the diaphragm within the microphone, the aft port having a significant acoustic resistance therein; and

the housing also having front and rear sound admitting openings communicating between the interior chamber and the exterior of the housing for freely supplying sound to the fore and aft ports, respectively, of the microphone, the rear opening to the chamber being disposed rear-

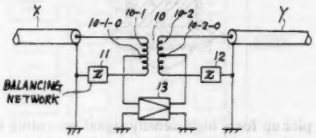
wardly of the front opening and the rear opening being spaced significantly closer to the inner side of the housing than said front opening so that the alignment between front and rear openings is at an oblique angle relative to the frontal direction.

3,946,169

BILATERAL SIGNAL TRANSMISSION SYSTEM

Kenichi Miya, Musashino, Japan, assignor to Kokusai Denwa Kabushiki Kaisha, Japan

Filed July 25, 1974, Ser. No. 491,923
Claims priority, application Japan, July 28, 1973, 48-85262
Int. Cl.² H04B *1/52, 3/36*
U.S. Cl. 179—170 R **3 Claims**



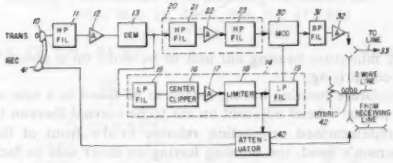
1. A bilateral transmission system for bilateral signal transmission through a two-wire transmission line, including a plurality of first bilateral transmission circuits and a plurality of second bilateral transmission circuits which are alternately inserted in the two-way transmission line at substantially regular intervals; said first bilateral transmission circuits each comprising a first amplifier for transmitting the signal in the forward direction, a first passive by-pass line for transmitting the signal in the reverse direction and a first pair of hybrid circuits for connecting said first amplifier and said first by-pass line in parallel and to the two-way transmission line; and said second bilateral transmission circuits each comprising a second amplifier for transmitting the signal in the reverse direction, a second passive by-pass line for transmitting the signal in the forward direction and a second pair of hybrid circuits for connecting said second amplifier and said second by-pass line in parallel and to the two-way transmission line.

3,946,170

SELF REGULATING TELEPHONE SETS

Fred A. Brooks, 37 Lancaster Ave., Maplewood, N.J. 07040

Filed Nov. 29, 1973, Ser. No. 420,330
Int. Cl.² H04M *9/08*
U.S. Cl. 179—170 R **5 Claims**



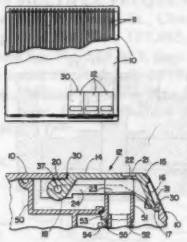
1. A self regulating telephone set for a telephone system having a local plant and long distance trunk circuits comprising a transmitting transducer receiving voice signals represented by product waves of the form $f(A)t \times f(B)t$ where $f(A)t$ represents the amplitude of informational signal $f(B)t$ and a high frequency wave $f(B)t$, said voice signals being converted to representative electrical signals, a first demodulator receiving said representative signals, said first demodulator providing output signals permitting separation thereafter of the signal representative of $f(B)t$ and the signal representative of $f(A)t$, a high frequency branch including a first high pass filter, a first amplifier of preselected gain to nullify losses, and a second high pass filter in a series arrangement in the recited sequence, said high frequency branch passing exclusively the signal representative of $f(B)t$, a low frequency branch including a first low pass filter, a center clipper, a second amplifier, a limiter, and a second low pass filter in a series arrangement in the recited sequence, said low frequency branch passing only the signal representative of $f(A)t$, said second amplifier having a preselected gain to nullify incidental losses, a modulator simultaneously receiving the output signals at predetermined magnitudes from said high and low pass branches to provide a constant output transmission signal therefrom to obtain a preselected volume for said local plant and long distance trunk circuits.

3,946,171

MULTIPLE PUSHBUTTON SWITCH ASSEMBLY FOR TELEPHONE SETS AND THE LIKE

Gerd Kuhfus, London, Canada, assignor to Northern Electric Company, Limited, Montreal, Canada

Filed June 17, 1974, Ser. No. 479,744
Int. Cl.² H01H *13/02*
U.S. Cl. 200—5 R **4 Claims**



1. A push button switch assembly for pushbutton actuation of switches, comprising:

a housing, an aperture in said housing, and a plurality of pushbuttons pivotally mounted in said aperture, each of said pushbuttons of rectangular plan form and including pivotting means at a rear end, the pushbuttons extending side-by-side in said apertures;

parallel spaced apart ribs in said housing, said ribs extending one along each side of said aperture and normal to and away from an outer surface of the housing;

a shaft extending through said ribs on said housing and through said pivotting means on each of said push-buttons, and

locating means on each of said pushbuttons to locate each button relative to the housing in a direction corresponding to the pivotal movement of the pushbutton,

a plurality of switches in said housing beneath said pushbuttons, a switch beneath each pushbutton, each switch including a movable member and resilient means biasing said movable member into contact with an under surface of the related pushbutton, and said movable member biasing said pushbutton to an initial position having a top surface flush with a top surface of said housing.

3,946,172

LATCHING APPARATUS

Peter M. Thorp, Lydbrook, England, assignor to Rank Xerox Ltd., London, England

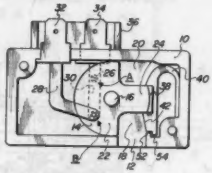
Filed Dec. 12, 1974, Ser. No. 532,279
Int. Cl.² H01H *9/28*
U.S. Cl. 200—44 **10 Claims**

1. A latching apparatus, including:

a key member;

a housing having an aperture therein to receive said key member, said housing defining a chamber in communication with the aperture therein; and

an actuating member mounted rotatably in the chamber of said housing and having a recessed portion therein for receiving said key member, said actuating member being rotated from an opened position with the recessed portion therein substantially aligned with the aperture in said



housing to a closed position wherein a portion of said actuating member substantially blocks the aperture in said housing, said key member being arranged to engage the recessed portion of said actuating member to rotate said actuating member from the opened position to the closed position securing said key member in the aperture of said housing with a portion thereof extending outwardly therefrom so that removal of said key member returns said actuating member to the opened position.

3,946,173

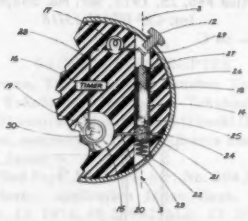
ACCELERATION/DECELERATION ACTUATING MECHANISM FOR WRIST INSTRUMENTS

Terry M. Haber, Santa Ana, Calif.

Filed Jan. 6, 1975, Ser. No. 538,743

Int. Cl.² H01H *35/00;* **G04B** *19/30;* **G04C** *23/10*

U.S. Cl. 200—52 R **2 Claims**



1. In combination:

a. an instrument adapted to be worn on the wrist and including a casing incorporating a power source, a display and electrical means for rendering the display visible when actuated; and

b. an actuating means incorporated in said casing for actuating said electrical means in response to a deliberate, rapid acceleration and/or deceleration of the wrist, said actuating means including:

1. an elongated tube of electrically conductive material secured in the casing with its longitudinal axis generally at a right angle to the direction of the wrist when the instrument is worn, said casing being electrically connected to one terminal of said power source;

2. a resilient conducting means bearing against one end of said tube, the other end of said resilient conducting means engaging said casing to provide an electrical connection between said elongated tube and casing;

3. a magnet secured in said tube at said one end portion of the tube;

4. a conducting ball normally held in said one end portion of the tube by said magnet;

5. an insulating sleeve in the other end portion of said tube; and

6. a conducting body in said other end portion held in said insulated sleeve so as to be electrically isolated from said tube, said conducting body being connected to said electrical means and having an inclined surface facing said one end of said tube such that said body and lower interior wall of the tube define a V-shaped entrance into which said ball seats to effect electrical contact between the body and tube whereby

when said deliberate, rapid acceleration and/or deceleration of the wrist is effected, said ball is shaken free of said magnet to travel to said other end of said tube and make at least one momentary contact with said conducting body so that a circuit is completed from said one terminal through said casing, tube, ball and said conducting body to said electrical means.

3,946,174

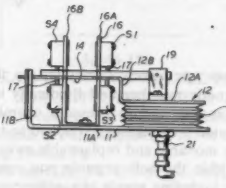
POSITIVE AND NEGATIVE PRESSURE BREATH CONTROL DEVICE

John A. Herbst, 320 South St., Morristown, N.J. 07960

Filed Sept. 27, 1974, Ser. No. 509,794

Int. Cl.² H01H *35/32*

U.S. Cl. 200—81.4 **8 Claims**



1. A positive and negative pressure sensitive switching device comprising a base member, a pivot lever, pivot means pivotally mourting said pivot lever to said base, expandible chamber means interconnected between said base member and said pivot lever, said chamber means being expanded when subjected to a positive pressure and being contracted under negative pressure whereby said pivot lever is displaced about said pivot means accordingly, switch means mounted on said base member, said switch means including at least a pair of switches, an actuating arm, means pivotally connecting said actuating arm on said pivot lever, said actuating arm operating one of said switches when said chamber means is expanded under positive pressure, and whereby said actuating arm operates another of said switches when said chamber means is contracted under a negative pressure.

3,946,175

MAGNETIC PRESSURE INDICATOR FOR A CONTAINER

Abdul N. Sitabkhan, Monrovia, Calif., assignor to HTL Industries, Inc., Pasadena, Calif.

Filed Dec. 3, 1973, Ser. No. 421,152

Int. Cl.² H01H *35/32*

U.S. Cl. 200—83 L **5 Claims**

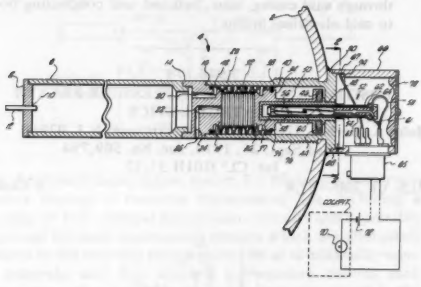
1. In a pressurized fluid container system subject to temperature variations having a temperature compensated pressure indicator for determining any fluidic leaks from a pressurized storage container of a first fluid such as fire extinguisher fluid in an aircraft and a primary pressure chamber connected to the first fluid pressure in the storage container, the improvement comprising:

a housing having a secondary pressure chamber adjacent the primary pressure chamber and containing a quantity of a second fluid having substantially the same pressure

temperature response characteristics as the first fluid in the storage container, the secondary pressure chamber housing primarily formed from a material having a high thermal conductivity capable of transmitting thermal changes in the first fluid of approximately 150°F per minute to the second fluid within the secondary pressure chamber whereby the pressure temperature response characteristics of both fluids will be substantially the same;

a movable metal bellows formed of welded metal rings sealed in the housing between the primary and secondary pressure chambers and repetitively responsive to their relative pressure changes throughout a temperature range of at least 68°F to a minus 65°F;

a magnetic member operatively connected to the metal bellows; and



switch means operatively controlled by the movement of said magnetic member and fluidically isolated from the primary and secondary pressure chambers, including a hollow guide post member attached to the housing and a relatively movable and replaceable switch assembly positioned within the hollow guide post member, the switch assembly including a pair of cantilevered electrodes, the switch means responsive to a predetermined strength of the magnetic force field for moving the cantilevered electrodes to provide a signal representative of any pressure differential in the primary and secondary pressure chambers indicating a leak in the storage container, wherein the metal bellows connected between the primary and secondary pressure chambers includes a post member movably mounted around the guide post member.

3,946,176

DIFFERENTIAL PRESSURE SWITCH

Randall Goff, Weston, and Leonard P. Delvecchio, Trumbull, both of Conn., assignors to Dresser Industries, Inc., Dallas, Tex.

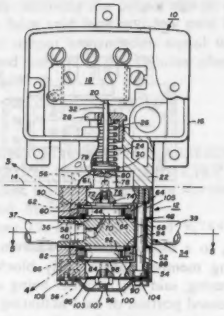
Filed Dec. 4, 1974, Ser. No. 529,866
Int. Cl.² H01H *35/34*, *35/38*
U.S. Cl. 200—83 J **9 Claims**

1. A pressure switch including an electrical switching mechanism, a pressure movable actuator for operating said switching mechanism between on-off positions, a range spring operatively effective to oppose pressure induced movement of said actuator, and a differential pressure unit comprising in combination:

a. body means having a pair of separated fluid inlets in which to receive pressurized fluid from different sources, a first of said inlets communicating with a first fluid outlet opening in said body means and a second of said inlets communicating with a second fluid outlet opening in said body means;

b. a pair of spaced apart diaphragm-piston assemblies supported with said body means intervening therebetween, one of said assemblies being exposed in pressure-tight relation to the first of said fluid outlet openings and the second of said assemblies being exposed in pressure-tight relation to the second of said fluid outlet openings; and

c. a unitary force transmitting means concomitantly engaged by each of said diaphragm-piston assemblies for



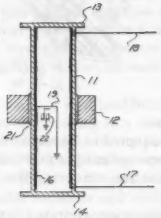
operably transmitting a pressure induced force against said actuator in opposition to said range spring correlated to the difference in pressures exerted against said assemblies by the different fluid pressures received at said inlets.

3,946,177

LIQUID-LEVEL SENSOR UTILIZING FERROMAGNETIC FLUID

John Paul Carrico, Royal Oak, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 25, 1975, Ser. No. 552,827
Int. Cl.² H01H *35/18*
U.S. Cl. 200—84 C **5 Claims**



1. A liquid level detector comprising:

a magnetic member;

a casing member, said magnetic member and said casing member being arranged for relative movement and having a clearance space between said members;

a ferromagnetic fluid disposed in said clearance space and retained by the magnetic field of said magnetic member; and

sensor means supported by said casing member for providing a signal representative of the relative position of said members.

3,946,178

DEVICE FOR INDICATING THE PRESENCE OF A LOAD ON A VEHICLE SEAT

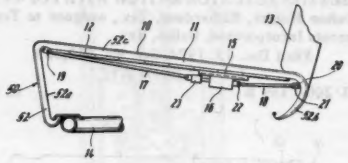
Dieter Eberle, Tamm, Wurttemberg; Dieter Hanselmann, and Hans Prohaska, both of Bietigheim, Wurttemberg, all of Germany, assignors to SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH, Germany

Filed Apr. 20, 1972, Ser. No. 245,906

Claims priority, application Germany, Apr. 22, 1972, 7115515

Int. Cl.² H01H *3/14*

U.S. Cl. 200—85 A 9 Claims



1. A device for indicating the loading of a seat, particularly an automobile seat, comprising a seat having a spring suspension with an encircling frame, a plate connected to the underside of said spring suspension, a pull switch mounted on said plate, said pull switch having an actuator member extending outwardly from one end of said switch housing and being movable inwardly and outwardly in respect to said switch housing between at least two switch positions, and resilient means supporting said pull switch at the underside of said spring suspension and including a first resilient part connected to said actuator member and to one side of said spring suspension frame and a second resilient part connected to said switch housing in the opposite side of said spring suspension frame from said one side, said switch being movable upon loading and sagging of said spring suspension to cause movement of said actuator from the first switch position to the second switch position, said switch including means for returning said actuator to a first position when the load is removed from said spring suspension.

3,946,179

VACUUM INTERRUPTER

Minoru Murano, Tokyo; Satoru Yanabu; Toru Tamagawa, both of Yokohama; Nobuyuki Takahashi, Kawasaki; Hiroyuki Okumura, Chigasaki, and Hiroshi Ohhashi, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

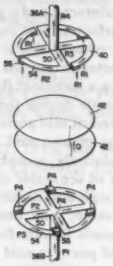
Filed Sept. 10, 1974, Ser. No. 504,982

Claims priority, application Japan, Sept. 10, 1973, 48-101870; Mar. 13, 1974, 49-28092; Mar. 13, 1974, 49-28093; Apr. 5, 1974, 49-38690; May 28, 1974, 49-61044[U]; June 20, 1974, 49-72342[U]

Int. Cl.² H01H *33/66*

U.S. Cl. 200—144 B 8 Claims

1. A vacuum interrupter comprising a vacuum vessel; a pair of current carrying rods arranged in a manner aligned with each other and having one end extending into the interior of the vacuum vessel, at least one of said current carrying rods being axially movable; a pair of main electrodes each connected to the end of one current carrying rod and having a plurality of slits extending from the periphery toward the center thereof; at least one coil electrode connected between one main electrode and the corresponding current carrying rod; the coil electrode comprising a plurality of first conductor arms extending substantially radially from the central portion thereof to permit currents branched from arc current to flow toward the periphery thereof, a plurality of second conductors each arcuately extending in the same direction from the forward end of one of the first conductor arms toward the forward end portion of the adjacent first conductor arm with a space left therebetween, and a plurality of third conductors extending from the free ends of the second conductors and connected to the main electrode; said first, second and third conductors being effective to create a substantially uniformly distributed magnetic field in a direction perpendicular to the electrode surface of the main electrode by the branched currents flowing therethrough; said slits being effective to reduce eddy current to be developed on the surface of the main electrode by the magnetic field, while leading the branched currents on the main electrode to flow through the center portion of the main electrode, thus preventing the magnetic field from being weakened by the eddy current and branched currents.



3,946,180

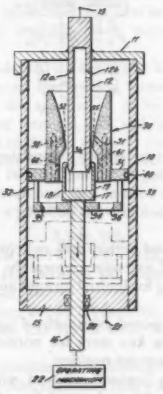
DOWNSTREAM INJECTION NOZZLE FOR PUFFER CIRCUIT INTERRUPTER

Gerald A. Votta, Prospect Park, and Leonard J. Kucharski, Harleysville, both of Pa., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Apr. 22, 1974, Ser. No. 462,611

Int. Cl.² H01H *33/88*

U.S. Cl. 200—148 A 7 Claims



1. A nozzle structure for a puffer type interrupter; said puffer type interrupter including a pair of separable contacts, a gas flow directing nozzle of insulation material which concentrically surrounds said pair of separable contacts for directing a flow of gas through arcs drawn between said pair of separable contacts as they separate; said gas flow directing nozzle having open opposite ends; gas pressure generating means connected to one of said opposite ends for producing

a flow of gas in a single direction, and through said nozzle from said one of its said opposite ends to the other of said opposite ends at least while said pair of separable contacts are opening; said flow of gas in a single direction being generally along the axis of said nozzle and said pair of contacts moving generally along the axis of said nozzle when said pair of contacts separate; said nozzle having a throat restriction generally upstream of the region of contact separation between said pair of separable contacts; and a plurality of ports extending into the interior surface of said nozzle at an axial location generally downstream of said throat restriction; one end of said ports being connected to regions upstream of said nozzle restriction and injecting a turbulent flow of relatively cool gas downstream of said nozzle during the separation of said pair of contacts; the other end of said ports being connected to said gas pressure generating means; said gas pressure generating means including a relatively movable piston and cylinder connected to said pair of separable contacts, whereby a flow of gas is produced through said nozzle when said pair of separable contacts is operated; said nozzle including generally axially extending channels therein for connecting said other end of said plurality of ports to said gas pressure generating means.

3,946,181
PUSH BUTTON-TYPE SWITCH

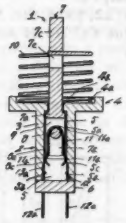
Koji Takamizawa, 795 Asahi Kamishirrane-cho, Yokohama, Kanaga; Shitiro Shimizuhata, 2130 Yamazaki-cho, Machida, Tokyo; Akinori Shinonaga, 324-4 Shimoishihara, Chofee, Tokyo, and Masaru Tsuruta, 1-24 Nishiki-cho, Tachikawa, Tokyo, all of Japan

Filed June 11, 1974, Ser. No. 478,303

Claims priority, application Japan, June 15, 1973, 48-70057[U]

Int. Cl.² H01H *13/52, 3/48*

U.S. Cl. 200—159 R **4 Claims**



1. A push button-type switch comprising in combination:

a rectangular casing including parallel side walls, parallel end walls, and a bottom wall, and opening at the top, said side, end and bottom walls defining a switching chamber therebetween,

a key stem received within said switching chamber with a portion thereof extending upwardly through said open top of the casing for limited upward and downward movement,

a return spring disposed externally of said casing about said extension of the key stem for normally urging the key stem in its uppermost position,

a movable spring contact received within said switching chamber to be driven by said key stem and stationary contact means secured to said side walls to be engaged by said movable spring contact,

said key stem including a bifurcated base portion with opposite legs at the lower end of the key stem disposed and received within opposite ends of said switching chamber and a cross bar extending between said legs in a spaced relationship to the underside of said base portion, and

said movable spring contact comprises a substantially U-shaped leaf spring having a pair of legs connected at the upper ends and embracing said cross bar, said legs of the spring each having an outwardly warped contacting portion at the lower end adapted to engage said stationary contact means,

whereby when said key stem is in its uppermost position a clearance is present between the underside of said base portion of the key stem and the top of said spring contact and when said key stem is in its lowermost position a clearance is present between the underside of said spring contact and said cross bar.

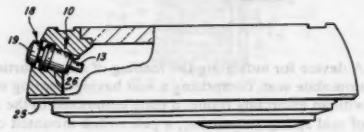
3,946,182
PUSHBUTTON ACTUATOR SWITCH WITH POP-IN HEAD

Paul Dalton Holder, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 13, 1974, Ser. No. 532,665

Int. Cl.² H01H *3/12*

U.S. Cl. 200—159 B **12 Claims**



1. A pushbutton actuator switch comprising:

a. a cylindrical housing having an opening at either end thereof;

b. an electrically conductive contact member in said housing extending through the opening at one end thereof;

c. an electrically conductive bias member mounted in said housing;

d. an electrically insulative spacer member mounted in said housing separating said electrically conductive bias member from normally making ohmic contact with said contact member;

e. a pop-in actuator member including a shaft with a pushbutton on one end thereof and a retention member on said shaft spaced from said pushbutton; and

f. a unilateral detent member mounted in said housing and having a plurality of bendable spring prong members for passing the shaft and retention member of said actuator member only from the direction of the opening at the other end of said housing; wherein

g. said actuator member is retained within said housing by said prong members in cooperation with an edge of said retention member and is movable within said housing to apply force against said conductive bias member for selectively causing said bias member to make ohmic contact with said contact member upon actuation thereof.

3,946,183
PUFFER PISTON GAS BLAST CIRCUIT INTERRUPTER WITH INSULATING NOZZLE MEMBER

Stanislaw A. Milianowicz, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 5, 1974, Ser. No. 458,255

Int. Cl.² H01H *33/88*

U.S. Cl. 200—148 A **11 Claims**

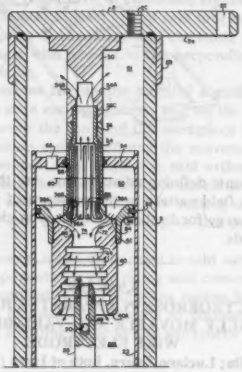
1. A gas-blast type of circuit-interrupter including, in combination:

a. a vented hollow contact having a plurality of circumferentially disposed inner contact fingers provided therewithin;

b. a cooperable relatively-solid non-vented contact extending interiorly within said plurality of circumferentially disposed inner contact fingers an appreciable extent in the closed-circuit position of the circuit-interrupter;

c. means defining an insulating hollow gas-flow nozzle member fixedly secured to said one vented hollow contact and through which said non-vented contact projects in the closed-circuit position of the interrupter;

d. piston means providing high gas pressure conditions externally of said vented hollow contact; and,



e. the contacting interengagement between the non-vented contact and the vented hollow contact providing a closed-valve condition during a predetermined portion of the opening operation preventing gas flow from said high pressure source, whereby the gas pressure has adequate time to be built up.

3,946,184

CIRCUIT BREAKER

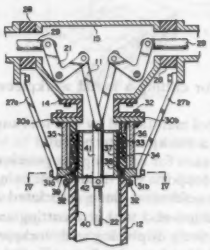
Yoshio Yoshioka, and Masanori Tsukushi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 4, 1974, Ser. No. 520,906

Claims priority, application Japan, Nov. 5, 1973, 48-123449

Int. Cl.[2] H01H *33/88*

U.S. Cl. 200—148 D **3 Claims**



1. A circuit breaker comprising at least a pair of circuit breaking units (18, 19, 20, 25, 26) having their movable contacts (20) disposed opposite to each other, a bracket (23) connecting mechanically said circuit breaking units to each other, supporting means (12 or 90) of electrical insulator for mechanically supporting and fixing said bracket in position in electrically insulated relation from ground, an actuator (7) disposed on ground, an actuating force transmitting means (10, 11, 21, 22, 24) for connecting said actuator to the movable contacts in said circuit breaking units, an electromagnetic actuating unit for driving said circuit breaking units in the circuit breaking direction by being energized by a current flowing through said circuit breaking units to be interrupted thereby, a member (14) of electrical insulator for mechanically connecting said electromagnetic actuating unit to said bracket while electrically insulating said electromagnetic actuating unit from said bracket, and members (28) of electrical insulator for mechanically connecting said bracket to said circuit breaking units while electrically insulating said bracket from said circuit breaking units.

3,946,185

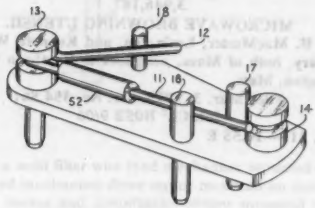
SPRING WIRE CONTACT ASSEMBLY

George Gruner, San Jose, Calif., assignor to Intersil, Inc., Cupertino, Calif.

Filed Aug. 21, 1974, Ser. No. 499,323

Int. Cl.[2] H01H *1/24*

U.S. Cl. 200—245 **8 Claims**



1. An electronic switch comprising:

a first terminal post,

second and third terminal posts spaced from said first post and closely separated from each other,

a spring wire extending between said second and third terminal posts and wrapped partially about said first terminal post,

means disposed on the opposite side of said second and third terminal posts from said first terminal post engaging said wire and limiting lateral movement of said wire thereat,

said wire being adapted for deflection to normally resiliently hold same against said second terminal post and further deflection by the application of an operating force between said first terminal post and said second and third terminal posts to deflect the wire out of contact with the second terminal post and into contact with the third terminal post.

3,946,186

ROCKER ACTUATING MECHANISM

Robert K. Howie, Jr., Decatur, Ill., assignor to The Grigoleit Company, Decatur, Ill.

Filed Dec. 26, 1973, Ser. No. 427,468

Int. Cl.[3] H01H *9/02, 3/02*

U.S. Cl. 200—339 **9 Claims**

1. An actuating mechanism including:

a housing having side, front and rear walls defining a cavity,

front and rear openings formed in said front and rear walls and leading into said cavity,

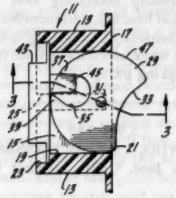
a rocker positioned in said cavity,

said rear opening being dimensioned to allow said rocker to be inserted therethrough into said cavity,

means engaging said rocker to permit no more than a portion of said rocker to project out of said housing through said front opening and to limit movement of said rocker in directions other than towards said rear opening,

a member closing said rear opening and having an inner wall

engaging said rocker to limit movement of said rocker towards said rear opening thereby holding said rocker for



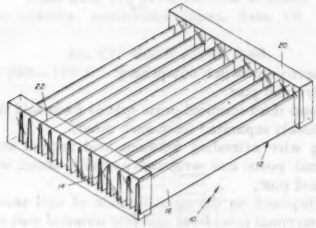
rotation of about a fixed axis, and
actuating means formed as a part of said rocker.

3,946,187

MICROWAVE BROWNING UTENSIL

George H. MacMaster, Lexington, and Kenneth W. Dudley, Sudbury, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Mar. 3, 1975, Ser. No. 554,861
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 E **6 Claims**



5. The combination comprising:
an enclosure;
means for radiating microwave electromagnetic energy within said enclosure; and
means for receiving and converting said energy into a substantially fringing electric field pattern having a 180° phase differential adjacent to one surface;
said energy receiving and converting means comprising an array of a plurality of conductive members each having a configuration defining two substantially equidistant adjacent leg portions terminating in free ends and a continuous apex portion;
each conductive member having a height of substantially one-quarter of a wavelength of said energy; and
means for supporting said conductive members in the desired array.

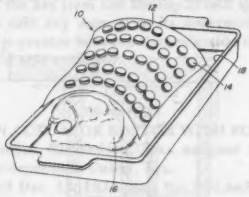
3,946,188

MICROWAVE HEATING APPARATUS WITH BROWNING FEATURE

Palmer P. Derby, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed June 19, 1975, Ser. No. 588,454
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 E **3 Claims**

1. Apparatus for heating with microwave energy comprising:
a flexible member of a microwave permeable material;
a plurality of spaced conductive elements supported by said flexible member;
each of said elements defining wall structure having a height of substantially one-quarter of a wavelength of the microwave energy;



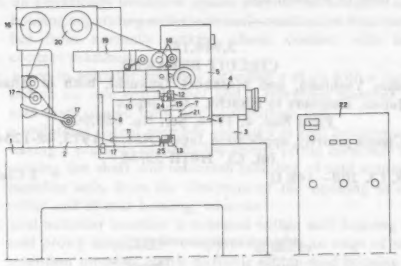
said elements defining adjacent one end thereof a fringing electric field pattern in the presence of microwave radiated energy for heating of surfaces in close proximity to said ends.

3,946,189

ELECTROEROSION APPARATUS HAVING A CYCLICALLY MOVABLE AND VARIABLY INCLINED WIRE ELECTRODE

Piero Pomella; Luciano Lauro, both of Ivrea (Turin), and Pier Gianni Scotti, Strambino (Turin), all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Continuation of Ser. No. 304,708, Nov. 8, 1972, abandoned.
This application July 1, 1974, Ser. No. 484,735
Claims priority, application Italy, Nov. 9, 1971, 70657/71
Int. Cl.² B23P 1/08
U.S. Cl. 219—69 E **32 Claims**



1. Apparatus for cutting a metal workpiece by electroerosion, comprising:
an electrode tool maintained by two tool supports on opposite sides of a workpiece to be cut;
controllable means for adjusting the position of at least one of said tool supports for variably inclining said tool with respect to a reference plane associated with said workpiece to position said tool at a cutting angle;
means for relatively displacing said workpiece and said one tool support along a pair of coordinates for cutting said workpiece along a predetermined path defined by variable acceleration components of the predetermined path; and
means solely responsive to said variable acceleration components for controlling said adjusting means in accordance with said variable acceleration components to maintain the tool at a cutting angle during the cutting along said predetermined path.

2. Apparatus for cutting a metal workpiece by electroerosion in which an electrode tool is maintained by two tool supports on opposite sides of a workpiece to be cut, comprising:

a movable workpiece support for moving said workpiece relative to said electrode tool on a reference plane associated with said workpiece and defined in accordance with two orthogonal coordinate axes;

feed means responsive to position signals for effecting said relative movement of said workpiece support and said tool for enabling a predetermined profile to be cut in said workpiece;

adjusting means responsive to command signals for adjusting the position of at least one of said tool supports relative to the other for enabling said electrode tool to have a cutting angle with respect to the perpendicular to said reference plane;

interpolating means fed on the basis of a path defined in digital form on a record member and on the basis of the voltage between the tool and the workpiece for generating said position signals defining the movements of said workpiece support with respect to said orthogonal coordinate axes as a function of variable acceleration components along said axes to effect the cutting of the workpiece along said profile according to the defined path; and

intermediate means solely responsive to said variable acceleration components for generating said command signals which are supplied to said adjusting means for adjusting the position of said tool supports to maintain the electrode tool at a cutting angle as said workpiece is cut along the profile.

3,946,190

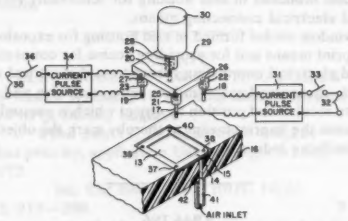
METHOD OF FABRICATING A SEALING COVER FOR AN HERMETICALLY SEALED CONTAINER

Norman Hascoe, Portchester, N.Y., assignor to Semi-Alloys Incorporated, Mount Vernon, N.Y.

Division of Ser. No. 454,733, March 25, 1974, Pat. No. 3,874,549, which is a division of Ser. No. 257,390, May 26, 1972, Pat. No. 3,823,468. This application Oct. 22, 1974, Ser. No. 516,889

Int. Cl.² B23K *11/10*

U.S. Cl. 219—91 **6 Claims**



1. The method of fabricating an hermetic sealing cover for a container comprising:

superimposing a preformed ring of heat-fusible material upon a cover and in registry with the periphery thereof;

and locally heating said ring to a fusing temperature at a plurality of spaced points, thereby producing an effective attachment between said ring and said cover at each of said points.

3,946,191

WELDING APPARATUS

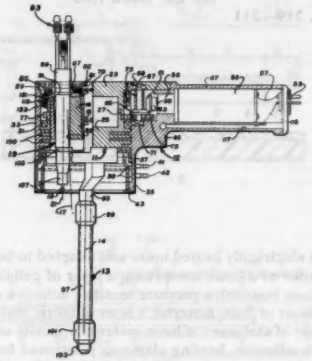
Weldon Charles Graham, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Sept. 26, 1974, Ser. No. 509,336

Int. Cl.² B23K *9/00*

U.S. Cl. 219—125 R **5 Claims**

1. Apparatus for welding a tube to a tube sheet, comprising, a rotor, means for supporting and rotating said rotor about a rotor axis, locator means for positioning said rotor axis with respect to the tube being welded, a weld torch having a nonconsumable weld electrode projecting therefrom, means supporting said weld torch in said rotor for rotation with respect thereto with said weld electrode positioned spaced from said



rotor axis, a weld filler wire feed mechanism mounted on said rotor, a feed mechanism drive motor mounted on said rotor, and brush means and commutator means mounted on said rotor and said rotor supporting means for conducting electricity to said drive motor on said rotor.

3,946,192

METHOD OF MANUFACTURING A FRICTION DISC

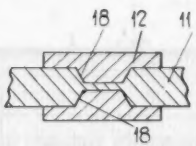
Brian Robert Allen, and Anthony William Harrison, both of Birmingham, England, assignors to Girling Limited, Birmingham, England

Filed May 17, 1974, Ser. No. 470,934

Claims priority, application United Kingdom, May 19, 1973, 23965/73; Sept. 4, 1973, 41403/73

Int. Cl.² B21J *1/06*

U.S. Cl. 219—149 **13 Claims**



1. A method of manufacturing a friction disc of the kind including a metal backing plate and a plurality of friction pads carried by the backing plate on at least one major surface thereof, the method comprising the steps of providing a plurality of powder compacts of friction material at the required positions on said major surface of the backing plate, and resistance heating each of the powder compacts to sinter the compacts into the required friction pads and to bond the pads to the backing plate, the resistance heating of each powder compact being effected by urging one electrode of a pair of electrodes against said compact to press the compact against said major surface of the backing plate and then passing a heating current through the compact between said pair of electrodes.

3,946,193

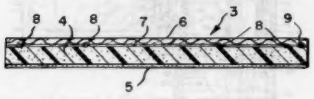
HEATED INNER SOLE AND BATTERY CASE FOR USE IN BOOT CONSTRUCTION

Erik O. Giese, 150 Ocean Lane Drive, Key Biscayne, Fla. 33149

Division of Ser. No. 416,209, Nov. 15, 1973, Pat. No. 3,859,496. This application Aug. 5, 1974, Ser. No. 494,826

Int. Cl.² H05B 1/00

U.S. Cl. 219—211 3 Claims



1. An electrically heated inner sole adapted to be applied to the interior of a boot, comprising a layer of cellular polyurethane foam material, a pressure sensitive adhesive on one side of said layer of foam material, a layer of fabric material on the other side of said layer of foam material opposite said pressure sensitive adhesive, heating elements positioned between said layer of foam material and said layer of fabric material and an electrical lead connected to said heating elements and extending exteriorly of said inner sole adapted to be connected to a source of energy.

3,946,194

BUILDING COMPRISING ONE OR MORE ROOMS OR CONFINED SPACES EQUIPPED WITH AN ELECTRIC HEATING INSTALLATION, AND/OR AN ELECTRIC HEATING INSTALLATION FOR THIS BUILDING, EQUIPPED WITH A HEATING DEVICE

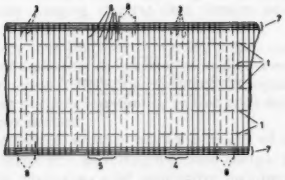
André B. de la Bretonière, Beethovenlaan 29, Doorwerth, Netherlands

Filed Nov. 18, 1974, Ser. No. 524,873

Claims priority, application Netherlands, Nov. 21, 1973, 7315916

Int. Cl.² H05B 1/00

U.S. Cl. 219—213 4 Claims



1. An electric heating system for at least one confined space of a building provided with an electric current source connectable therewith, said heating system consisting of thin heating layers comprising electrically conductive heating wires and interposed insulating wires, said heating layers distributed covering the entire boundary of said space so that each part of said boundary radiates the same amount of heat radiation in unit time per unit surface area, said amount of heat being controlled by the amount of electrical energy delivered to said heating system.

3,946,195

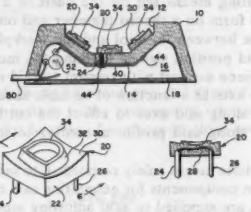
DEVICE FOR BRANDING INDICIA ON A TENNIS BALL

Dianne D. Lyons, West Indies House, 26 Tide Village, Rte. 00864, and William R. Chandler, 57A Salt River, both of Christiansted, St. Croix, V.I. 00820

Filed July 1, 1974, Ser. No. 484,860

Int. Cl.² H05B 1/00, 3/00; B44B 5/00

U.S. Cl. 219—216 9 Claims



1. An object marker comprising a housing, removable imprint means enclosed in said housing for searing identifying indicia onto the surface of the object,

heating means associated with the imprint means for heating the imprint means to searing temperature,

electrical circuit means mounted in said housing and adapted to be connected to a source of electrical power,

electrical connecting means extending from said heating means for removably connecting said heating means to said electrical circuit means,

said electrical circuit means including electrical receptacle means mounted in said housing for removably receiving said electrical connecting means,

and window means formed in said housing for exposing said imprint means and for providing access for connection of said electrical connecting means to said electrical receptacle means and said window being such size and shape as to receive and position an object which is pressed down against the imprint means to thereby mark the object with identifying indicia.

3,946,196

HAIR CURLING APPLIANCE

Robert S. Waters, and Meyric K. Rogers, both of Lancaster, Pa., assignors to Schick Incorporated, Lancaster, Pa.

Filed June 13, 1974, Ser. No. 478,896

Int. Cl.² H05B 1/00; A45D 1/20, 4/12

U.S. Cl. 219—222 3 Claims

1. A hair curling appliance comprising, in combination:

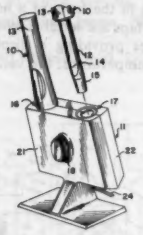
a pair of curling wands, each having a thermally insulated handle portion and a heat retaining working portion;

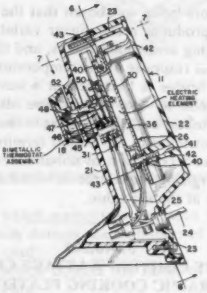
a housing having a pair of spaced apertures dimensioned to receive substantially the entire working portions of respective ones of said curling wands;

an electric heating element in said housing; and

means comprising a pair of juxtaposed heat-conductive retaining members in said housing in thermal communication with said heating element, said member having center portions forming a cavity wherein said heating element is received in captive engagement when said retaining members are joined, and trough-like inwardly facing end portions extending coaxially to respective ones

of said wand-receiving apertures substantially the length of said working portions of said wands to form a pair of





sockets within said housing for receiving said curling wands.

3,946,197

ELECTRODE WATER HEATING BOILER

Stanley Austen Williams, 10 Durlston Road, Parkstone, Poole, BH14 8PQ, Dorset, England

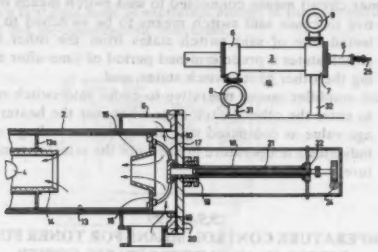
Filed July 19, 1974, Ser. No. 490,214

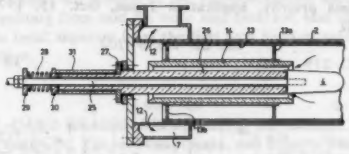
Claims priority, application United Kingdom, July 24, 1973, 35166/73

Int. Cl.² H05B *3/60*; H01C *10/02*

U.S. Cl. 219—290 9 Claims

1. An apparatus for heating fluids, particularly a high-voltage hot water boiler, comprising at least one fluid-heating unit, each of said fluid heating units including a housing formed of electrically conductive material and serving as a counter electrode, said housing having an inlet for conducting fluid to be heated in a path through said housing and an outlet for conducting heated fluid from said housing; means for supporting said housing so that the flow direction of said fluid path is closer to the horizontal than to the vertical; an electrode electrically insulated from said housing and extending in said flow direction and cooperating with said counter electrode so as to electrolytically heat the fluid flowing in said path; modifying means for modifying the electric current flow between said electrode and said counter electrode as a function of position, said modifying means comprising a carrier movable within said housing, a sleeve of electrically insulating material mounted on said carrier so as to move with the latter both in and opposite to the direction of fluid flow to or through a position in which said sleeve at least partly surrounds said electrode, and adjusting means connected to said carrier for moving the same to or through said position in which said sleeve surrounds said electrode; and flow control means including a nozzle located at one end of said carrier





adjacent to said inlet for directing incoming fluid substantially towards said electrode.

3,946,198

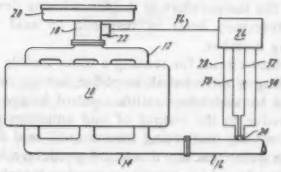
ELECTRICAL CONTROL SYSTEM FOR AN EXHAUST GAS SENSOR

Lawrence R. Foote, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed July 1, 1974, Ser. No. 484,896

Int. Cl.² H05B *1/02*

U.S. Cl. 219—497 9 Claims



1. A system for controlling the application of heat by a platinum heater wire to a ceramic exhaust gas sensor to maintain a selected temperature at the sensor comprising in combination:

a source of electrical energy;

switching means having an on and an off state for applying electrical energy from said source to the heater wire;

amplifier means having input and output terminals, said output terminal connected to said switch means for controlling the state of said switch means;

first voltage divider circuit means connected to said switch means for establishing a reference voltage value;

first means for applying said reference voltage value to one of said input terminals;

second voltage divider circuit means, which includes the heater, electrically connected in parallel with the first voltage divider circuit means for establishing a heater voltage value;

second means for applying said heater voltage value to another of said input terminals;

timer circuit means connected to said switch means operative to cause said switch means to be switched to a selected one of said switch states from the other of its switch states a predetermined period of time after entering the other of its switch states; and

said amplifier means operative to cause said switch means to enter the other switch state whenever the heater voltage value as compared with the reference voltage value, indicates a temperature in excess of the selected temperature.

3,946,199

TEMPERATURE CONTROL MEANS FOR TONER FUSING DEVICE IN AN ELECTROSTATIC COPIER

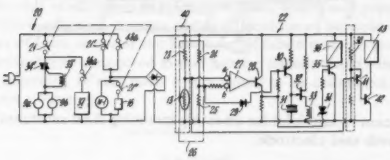
Yoshihiro Nakamura, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sept. 23, 1974, Ser. No. 508,493

Claims priority, application Japan, Oct. 15, 1973, 48-116081

Int. Cl.² H05B 1/02

U.S. Cl. 219—499 **10 Claims**



1. A temperature control network for a toner fusing device having an electrical heater in an electrostatic copier including copying motivating means, comprising:

a temperature sensing member responsive to the temperature prevailing within the toner fusing device,

a toner fusing device temperature regulating circuit including a temperature control bridge having therein said temperature sensing member and a resistor for setting a toner fusing temperature and controlling the current supplied to the heater in the toner fusing device for regulating the temperature in the toner fusing device at a first predetermined level in response to said temperature sensing member,

and another circuit for sensing a toner fusible temperature including a differential amplifier having an input connected to said temperature control bridge, and means responsive to the output of said amplifier for disabling said copying motivating means until said fusing device temperature reaches a second predetermined level as detected by said temperature sensing member,

thereby, sensing two different temperatures through the medium of one temperature sensing member, and as the result maintaining the temperature in the toner fusing device substantially constant and causing the copying operation of the copier operable upon starting of the operation of the copier.

3,946,200

PROPORTIONAL TEMPERATURE CONTROLLER

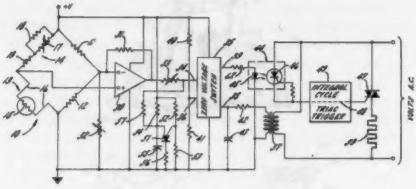
Peter Juodikis, Chicago, Ill., assignor to GCA Corporation, Bedford, Mass.

Filed Feb. 24, 1975, Ser. No. 552,761

Int. Cl.² H05B 1/02

U.S. Cl. 219—499 **12 Claims**

1. A temperature controller for a controlled space comprising in combination, a bridge having four resistive arms defining pairs of input and output terminals, the first and second arms having first and second resistors having a predetermined ratio, the third arm having a temperature sensitive resistor with a temperature coefficient of resistance which gradually varies with increasing temperature to produce inherently non-linear response, the fourth arm including an adjustable setting resistor, a fixed shunt resistor in parallel with the setting resistor, a fixed series resistor interposed in series with the paralleled setting resistor and shunt resistor, the adjustable setting resistor being in the form of a linearly tapped decade resistor in which the taps are settable by a bank of display type thumbwheel switches providing a display of set resistance directly in units of temperature, the values of the fixed shunt



and series resistors being so chosen that the variation of the setting resistor produces a non-linear variation in the resistance of the setting arm which tracks, and thus compensates for, the non-linear response of the temperature sensitive resistor so that the bridge is balanced at a sensed temperature which corresponds to the temperature displayed on the thumbwheel switches, a source of heat in the space, and control circuitry connected to the output terminals of the bridge and responsive to a condition of unbalance of the bridge for correctively energizing the source of heat for maintenance of the temperature at the set value.

3,946,201

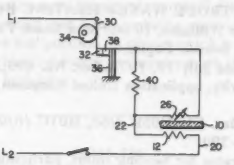
TEMPERATURE LIMITING WATTAGE CONTROL FOR A CERAMIC COOKING PLATFORM

George L. Hetrick, Mansfield, Ohio, assignor to White-Westinghouse Corporation, Cleveland, Ohio

Filed Feb. 27, 1975, Ser. No. 553,847

Int. Cl.² H05B 1/02

U.S. Cl. 219—511 **4 Claims**



1. A temperature limiting wattage control for a cooking platform which is itself heated by an underlying main heating element to supply heat for transfer to a cooking vessel supported on the platform, comprising:

a thermal cycling, user-operated control switch including a bimetal carrying a cycling contact and a heater associated with the bimetal for controlling the position of said bimetal and cycling contact, said bimetal heater being connected in series between said cycling contact and one side of said main heater; and

a sensor having a positive temperature coefficient of resistance throughout a range of temperatures up to the maximum selected safe operating temperature of said platform, said sensor being electrically connected to said one side of said main heater and in parallel with said bimetal heater, and located to respond to the heat of said cooking platform to provide an increasing resistance with an increasing platform temperature.

3,946,202

INFORMATION WRITING DEVICE

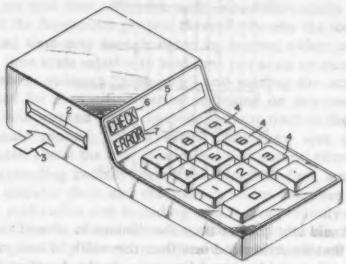
Tadasu Taniguchi, Tokyo; Iwao Hosaka, and Shigeru Yoshida, both of Chichibu, all of Japan, assignors to Canon Kabushiki Kaisha and Canon Denshi Kaburshiki Kaisha, both of Tokyo, Japan

Filed Sept. 27, 1974, Ser. No. 509,850

Claims priority, application Japan, Sept. 29, 1973, 48-109854

Int. Cl.² G06K 5/00, 7/08

U.S. Cl. 235—61.7 B 18 Claims



1. An information writing device comprising;

a roller which moves the card on which is to be written information;

a motor to drive said roller;

keyboard which feeds information input that is to be written on said card;

a shift register which memorizes the input information;

first switch which detects the initiation of forward movement of said card;

second switch which detects the finish of forward movement of said card;

a motor controller which causes said motor to rotate in the direction of forward movement of said card upon receipt of the output signal of said first switch and causes said motor to rotate in the direction of backward movement of said card upon receipt of the output signal of said second switch;

a mode selector which selects the shifting direction of information in said shift register responsive to the output signals of said first and second switches;

a read head which reads out the synchronizing signals recorded on said card;

a read-write head which writes information on said card and reads out information from said card;

a selector which selects the state of said read-write head depending on the output signals of said first and second switches;

means which applies said synchronizing signal to said shift register depending on the selection of said mode selector to produce information from said shift register;

means which collates the information read out by said read-write head with the information produced by said shift register; and

means which display the collating.

3,946,203

OPTICAL READER FLUORESCENCE CONTROL

Richard M. Hecht, Dallas, and William B. Wiegman, Richardson, both of Tex., assignors to Recognition Equipment Incorporated, Irving, Tex.

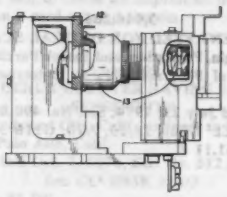
Filed June 26, 1974, Ser. No. 483,307

Int. Cl.² G06K 7/12

U.S. Cl. 235—61.11 E 16 Claims

1. In an automatic reader of information recorded on a document in fluorescent ink where the document is propelled at high speed past a reading station, the combination which comprises:

means to excite said ink at said read station with radiation in a first pass band of excitation energy in the blue portion of the electromagnetic spectrum;



a light sensitive detector at said read station; and

means for optically focusing light in a second pass band in the visible red portion of the electromagnetic spectrum emanating from said ink onto said detector, said second pass band separate from the first pass band of said blue portion.

3,946,204

CARD READER PROTECTING DEVICE

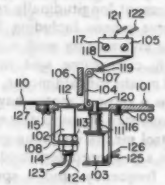
Tadasu Taniguchi, Tokyo; Iwao Hosaka, and Shigeru Yoshida, both of Chichibu, all of Japan, assignors to Canon Kabushiki Kaisha and Canon Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed July 10, 1974, Ser. No. 487,369

Claims priority, application Japan, July 13, 1973, 48-79590; July 13, 1973, 48-79589

Int. Cl.² G06K 7/06; B65H 9/06; G11B 15/18; G06K 19/08

U.S. Cl. 235—61.11 R 16 Claims



3. A protecting device for card reader equipment in which information on a recording medium such as a card and the like is read, comprising:

an aperture portion provided in a passage of the recording medium and adapted to lead said recording medium to said card reader equipment;

detecting means for detecting a normal material in said recording medium and developing an electrical output signal responsive to the detection thereof, said detecting means being disposed in the passage of the recording medium before said aperture portion with respect to a forward transporting direction of said recording medium;

shutter means for inhibiting the recording medium from passing through said aperture portion when no output signal is developed by said detecting means, said shutter means being disposed in the passage of the recording medium after said aperture portion with respect to the forward transporting direction of said recording medium;

control means for controlling said shutter means to permit said recording medium to pass through said aperture portion when said detecting means detects the normal material in said recording medium, and to inhibit said recording medium from passing through said aperture portion when said detecting means does not detect the normal material in said recording medium; and

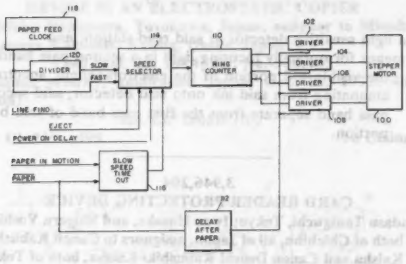
holding means for developing a hold signal to be applied to said control means to hold such a state that said control means permits said recording medium to pass through said aperture portion as long as said recording medium is placed upon said shutter means.

3,946,205

DOCUMENT FEED FOR OPTICAL SCANNER

Leland A. Melugin, Plantation, and Joseph Parchesky, Coconut Creek, both of Fla., assignors to Datatype Corporation, Miami, Fla.

Filed July 22, 1974, Ser. No. 490,809
Int. Cl.² G06K *13/26*, *7/10*; G11B *5/86*
U.S. Cl. 235—61.11 E **15 Claims**



1. In a system for optically reading data printed in transversely extending lines longitudinally spaced apart on a document comprising a scanning head including electro-optical means for scanning and reading data, means for supporting said scanning head for transverse movement relative to such a document and along each such line of data, drive means for moving such a document longitudinally relative to said scanning head, said drive means including friction drive roller means for engaging and moving such a document, a motor, means for drivingly connecting said motor to said roller means, and control means for said motor, the improvement in which said motor is a stepper motor having an output shaft which is advanced one step about its axis each time said motor is pulsed, said control means including generating means for producing pulses at a first predetermined frequency and at a second and lower frequency, and a speed selector circuit operatively connected to said generating means for selecting which of said first and second frequency pulses are to be fed to said motor, and optical means for detecting lines of data on such a document and stopping longitudinal movement of such document, said optical means being operatively connected to said generating means and effective to control the pulse output of said generating means.

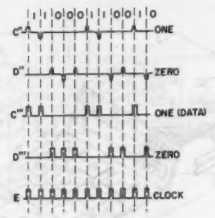
3,946,206

MAGNETIC-TYPE INFORMATION CARD AND METHOD AND APPARATUS FOR ENCODING AND READING

John C. Darjany, Signal Hill, Calif., assignor to R. D. Products, Inc., Victor, N.Y.

Filed Aug. 21, 1974, Ser. No. 499,198
Int. Cl.² G06K *7/08*; G11B *15/60*, *23/02*
U.S. Cl. 235—61.11 D **2 Claims**

1. A card reader for reading information magnetically recorded on a magnetic stripe extending lengthwise on a flexible resilient generally rectangular information card, comprising structural means forming a rectangular slot adapted to receive said card as it is manually inserted lengthwise into said slot, said slot having a width and thickness substantially equal to but greater than, the width and thickness, respectively of said card and such as to accommodate said card in a close but not binding fit, said slot having a length such as to accommodate all of said card except for a finger held portion at the end of said card, a magnetic reading head mounted on said structural means at a position along the width of said slot corresponding to the position of the magnetic stripe along the width of said card, the magnetic gap end of said reading head extending into one side of said slot to a point such that the remaining distance from said magnetic gap end to the other side of said slot is less than the thickness of said card, and means forming a relief hole in said structural means disposed at the other side of said slot at a position opposite the gap end of said reading head, said relief hole having a dimension in the direction of the



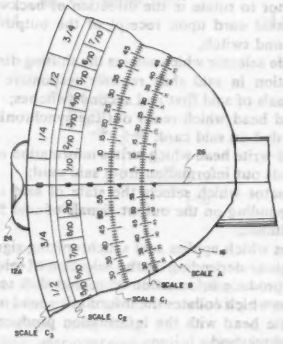
width of said slot greater than the dimension of said reading head in that direction and less than the width of said card in that direction, and having a dimension in the direction of the length of said slot at least as great as said reading head in that direction, the gap end of said reading head having a curved surface extending along the lengthwise direction of said slot, whereby, as the card is pushed into said slot and past said reading head, the said curved surface forces a portion of said card to form an indented localized area of deformation and stress at said relief hole.

3,946,207

TIME CARD COMPUTER

Henry J. Williams, P.O. Box 322, Rose Hill, N.C. 28458

Filed Nov. 30, 1973, Ser. No. 420,373
Int. Cl.² G06C *3/00*, *27/00*
U.S. Cl. 235—88 M **1 Claim**



1. A multi-scale circular disc time computer comprising: a first circular disc having three separate radially spaced total time worked scales inscribed thereon, said total time worked scales including a first circular scale divided into minute increments, a second circular scale divided into tenth-hour increments and a third scale divided into quarter-hour increments; a second circular disc rotatively mounted above said first circular disc about an axis that is concentric with said total time worked scale, and wherein the outer peripheral edge of said second circular disc is spaced radially inwardly from at least one total time worked scale inscribed on said first circular disc, and wherein said second circular disc includes a

reference time scale having consecutive minute increments of time circumferentially inscribed about a circular path on the front outer side thereof inwardly of the outer peripheral edge of said second circular disc such that when selectively set and viewed together equal increments of time on said time reference and total time worked scales are radially aligned; a third circular disc centrally disposed over said first and second discs and of a less diameter than either, said third circular disc being rotatively mounted about the same axis as said second circular disc and having an outer peripheral edge spaced inwardly of said time reference scale inscribed on said second circular disc, said third circular disc having a time out scale including minute increments of time corresponding to increments of time on said time reference scale circumferentially disposed about the front outer portion thereof whereby the total actual worked time may be calculated by moving either said reference time scale relative to said time out scale or vice versa to effectively subtract "time-out," and reading the actual time worked for a specified period indicated on any one of said total time worked scales opposite the stop time on the particular scale moved; and a radius indicating arm pivotably mounted about the axis of said first and second circular discs and extending radially therefrom over said first, second and third circular discs and the various scales inscribed on such discs, said radius arm including a back arm pivotally mounted about the axis of said first and second circular discs and extending radially therefrom adjacent the back side of said first circular disc, and wherein said back arm includes a turned outer end that generally extends around the outer periphery of said first circular disc, and a hairline extending radially inwardly from said outer turned end to said axis and aligned with said back arm and movable therewith as said back arm is pivoted about its axis of rotation.

3,946,208

SERVICE METER WITH PULSE COUNTER

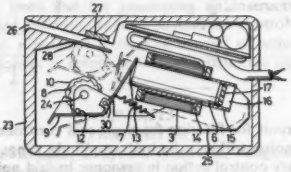
Lennart Carl Göte Borgström, Svangsta, Sweden, assignor to Record Taxameter AB, Halmstad, Sweden

Filed Mar. 18, 1974, Ser. No. 452,328

Claims priority, application Sweden, Mar. 21, 1973, 7303989

Int. Cl.² G06M *3/06*

U.S. Cl. 235—92 EA **13 Claims**



1. A service meter including

a housing having

totalling means for accumulating a total of service units consumed, said totalling means including:

a pulse counter,

pulse emitting means responsive to the consumption of a predetermined number of service units for emitting a pulse, said pulse emitting means including a contact and means for opening and closing said contact,

a solenoid including:

a coil connected to said pulse emitter and

a plunger advanced by said coil positioned to engage said pulse counter, said pulse counter including:

transmission means including a resistance-capacitance circuit in series with said pulse emitting means and said coil, whereby a current pulse from the pulse emitting means is applied to said coil immediately upon closing said contact, and a current is applied to said coil as long as said contact remains closed,

printing means, said printing means being mounted inaccessibly in said housing,

a card slot in said housing, and

means for selectively displacing said printing means toward said card slot to cause an imprint of the pulse counter total upon a card entered therein.

3,946,209

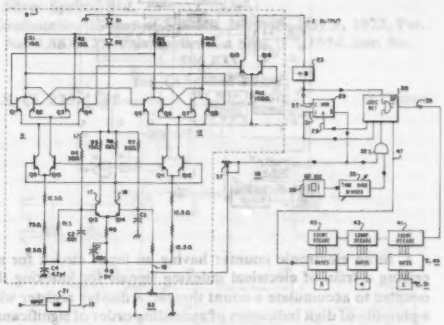
HIGH FREQUENCY COUNTER HAVING SIGNAL LEVEL SENSITIVITY

Hans Jekat, Redwood City, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 7, 1974, Ser. No. 512,653

Int. Cl.² H03K *21/02*

U.S. Cl. 235—92 DE **3 Claims**



1. Trigger circuitry comprising:

trigger means having one input connected to receive a source of bias signal and having another input connected to receive input signal and being operable in one logic state identified by an output of one logic level and in another logic state identified by an output of another logic level, said trigger means being actuated to operate in either one of two logic states in response to input signal applied to said other input with an amplitude greater than a signal level proportional to the amplitude of bias signal applied to said one input;

bistable means connected to receive the output of said trigger means and operable in one logic state identified by an output of one logic level until reset to another logic state identified by an output of another logic level, said bistable means being actuated to operate in said one logic state in response to an output received from said trigger means, and being actuated to operate in said other logic state in response to a reset signal applied thereto;

biasing means connected to apply to said one input of the trigger means a bias signal of one level in response to operation of said bistable means in said other logic state, and of another level lower than said one level in response to operation of said bistable means in said one logic state;

a source of reference signals;

gate means responsive to the output of the bistable means for passing reference signals therethrough in response to operation of the bistable means in said one logic state;

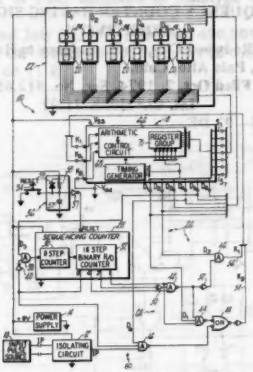
logic means coupled to receive the reference signals passed by said gate means for transmitting therethrough the outputs from said trigger means for a selected gate period, and for applying to said bistable means a reset signal after said selected gate period to reset said bistable means to said other logic state; and

counting means connected to said logic means for providing an indication of the accumulated number of pulses transmitted through said logic means during a gate period.

3,946,210
RESETTABLE ELECTRONIC COUNTER EMPLOYING A CALCULATOR CHIP

Donald Whiting Fleischer, Wethersfield, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

Filed Mar. 21, 1975, Ser. No. 560,599
Int. Cl.² H03K 21/32
U.S. Cl. 235—92 SA 12 Claims

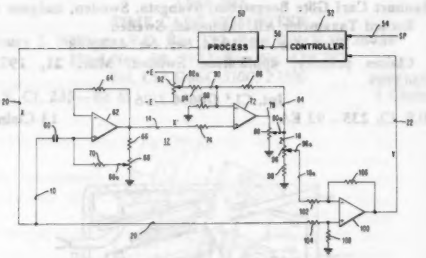


1. In an electronic counter having an input circuit for receiving a train of electrical indexing signals for indexing the counter to accumulate a count therein; a display register with a plurality of digit indicators of ascending order of significance for displaying a count, control input means for sequentially activating the digit indicators for sequentially entering digit counts therein respectively, and a binary input for receiving binary coded input signals for entering digit counts into the digit indicators respectively; and an integrated solid state calculator circuit element comprising an arithmetic and control circuit with register means for storing a plurality of separate multiple digit counts therein, including a selected count entered into the register means and an arithmetic count resulting from an arithmetic operation of the arithmetic and control circuit, and a binary output connected to the binary input of the display register and operable, to sequentially provide binary coded output signals indicative of the digit counts of a count stored in the register means for sequentially entering the digit counts into corresponding digit indicators of the display register respectively, for displaying the count with the display register, synchronizing circuit means for repetitively generating a sequence of timing signals, the synchronizing circuit means being connected to the arithmetic and control circuit and to the control input means of the display register for synchronously entering a count stored in the register means into the display register for display thereby, the arithmetic and control circuit having data entry circuit means and operable by selectively applying timing signals to the data entry circuit means for storing a selected count in the register means and displaying the selected count with the display register, the arithmetic and control circuit being further operable by selectively applying timing signals to the data entry circuit means for entering mathematical operation instruction signals into the arithmetic and control circuit for respectively effecting predetermined mathematical operations between the separate counts stored in the register means and storing in the register means the results of the selected mathematical operation as a new arithmetic count and displaying the new arithmetic count with the display register, and including entering an addition instruction signal for adding the selected count stored in the register means to any arithmetic count stored in the register means and storing, in the register means, the summation thereof as a new arithmetic count and displaying the new arithmetic count with the display register, the arithmetic and control circuit being further operable by selectively applying timing signals to the data entry circuit means for clearing any arithmetic count and any selected count stored in the register means; the improvement wherein the electronic counter comprises counter reset means having reset switch means operable for generating a reset signal and sequencing circuit means connected to the reset switch means and to the synchronizing circuit means and data entry circuit means and operable by a reset signal generated by the reset switch means to be automatically cycled through a reset sequence for sequentially and selectively applying timing signals to the data entry circuit means for sequentially operating the arithmetic and control circuit to clear any selected and arithmetic counts from the register means and clear the display register and to store a predetermined selected count in the register means; and wherein the counter input circuit comprises an input for receiving the train of electrical indexing signals and is operable by each indexing signal to selectively apply a timing signal to the data entry circuit means to enter an addition instruction signal to add to any arithmetic count stored in the register means the predetermined selected count stored in the register means during the reset sequence and store the summation thereof as a new arithmetic count in the register means and display the new arithmetic count with the display register.

3,946,211
AMPLITUDE LIMITED FILTER

Theron W. Jenkins, Jr., Ambler, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed July 17, 1974, Ser. No. 489,223
Int. Cl.² G06G 7/66; H04B 1/10
U.S. Cl. 235—151.1 1 Claim



1. A circuit for filtering from process controller input signals the noise within a limited amplitude range to prevent unnecessary control action in response to said noise comprising:

means for producing a filtering signal related to said input signal by the Laplace transform function $Ts/(1+Ts)$ where T is long with respect to the period of said noise, said filtering means including a differential amplifier having said input signal introduced into its non-inverting inputs through a capacitor and having the non-inverting input connected through a high impedance to ground to establish the time constant T at a value with respect to the period of said noise

means for limiting the magnitude of said filtering signal which includes a differential amplifier whose noninverting input receives the output of said filtering means and whose output circuit includes a potentiometer from which is tapped a feedback potential connected to the inverting input for adjustment of the level of the input signal at the non-inverting input necessary to drive the amplifier to saturation and thereby establish said limited amplitude range, and

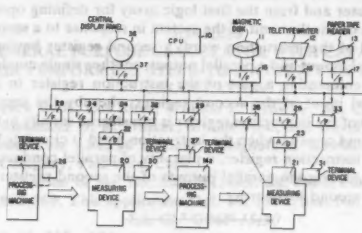
means for subtracting said filtering signal from said input signal.

3,946,212

AUTOMATIC QUALITY CONTROL SYSTEM

Hisaji Nakao; Nobuo Fukuma, both of Toyota; Hideyuki Matsubara, Toyoake; Tadahiro Takasu, Nishio, and Takao Yoneda, Kariya, all of Japan, assignors to Toyota Jidosha Kokyo Kabushiki Kaisha and Toyota Jidosha Kokyo Kabushiki Kaisha, both of, Japan

Filed June 18, 1974, Ser. No. 480,361
Claims priority, application Japan, June 18, 1973, 48-68584
Int. Cl.² G06F *15/36, 15/46*
U.S. Cl. 235—151.13 13 Claims



1. An automatic quality control system for a machine for processing discrete workpieces wherein a parameter of processed workpieces varies in accordance with a trend comprising:

measuring means separately disposed from said machine for generating information by measuring a plurality of workpieces processed thereby;

converting means for converting information obtained from said processed workpieces into digital values;

computing means responsive to said converting means for calculating by trend processing an estimated value for a yet unprocessed workpiece depending upon said digital values obtained from a plurality of preceding workpieces, for comparing said estimated value with a predetermined control limit and for generating an instruction signal when said estimated value is beyond the control limit; and

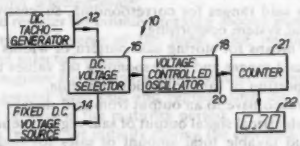
instruction means for indicating a need of adjustment of said machine in response to said instruction signal.

3,946,213

TAXIMETER

George John Kepper, Croydon, Australia, assignor to Haca Pty. Ltd., Doncaster, Australia

Filed Aug. 1, 1974, Ser. No. 493,550
Claims priority, application Australia, Aug. 10, 1973, 4423/73
Int. Cl.² G07B *13/00*
U.S. Cl. 235—151.32 4 Claims



1. A taximeter comprising:

generator means for generating a generator analog signal representing the speed of a taxi with which the meter is to be used;

a reference source for generating a reference analog signal representative of a predetermined speed of said vehicle;

selector means coupled to receive and compare the analog signals generated by said generator means and by said source; and

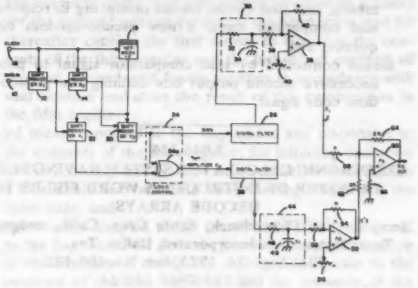
fare read-out means coupled to said selector means for displaying a fare charged which is advanced in dependence upon the reference analog signal when the generator analog signal is indicative of a lesser speed than said predetermined speed and in dependence upon the generator analog signal when the speed represented thereby is greater than said predetermined speed.

3,946,214

MULTI-LEVEL DIGITAL FILTER

Richard L. Stuart, Simpsonville, and Arvind M. Bhopale, Beltsville, both of Md., assignors to Rixon, Incorporated, Silver Spring, Md.

Continuation-in-part of Ser. No. 269,048, July 5, 1972, Pat. No. 3,883,727. This application Sept. 17, 1974, Ser. No. 506,833
Int. Cl.² G06F *15/34*
U.S. Cl. 235—152 9 Claims



1. A multilevel digital filter system comprising a first set of shift registers, means including a clock for reading the incoming data serially into said first set of shift registers, means including a second set of shift registers connected to the outputs of said first set of shift registers for reading out the data stored in said first set of shift registers in parallel; logic control means for conditioning the parallel outputs of said second set of shift registers; a plurality of digital shaping filters individual to the outputs of said logic control means for shaping said logic control outputs into a predetermined time response and summing means for summing the outputs of said digital filters to produce a bandlimited multilevel signal.

3,946,215

PSEUDO-RANDOM CODE GENERATOR

Jack L. May, Redmond, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sept. 30, 1974, Ser. No. 510,503
Int. Cl. G06f *1/02*; H03k *3/82*
U.S. Cl. 235—152 10 Claims

1. An apparatus for generating a pseudo-random code signal, comprising:

first circuit means operative to produce a plurality of first output bits which define a pseudo-random sequence;

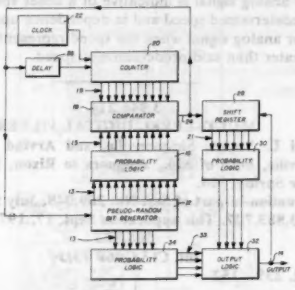
at least one logic gating means responsive to more than one of said first output bits, said logic gating means providing a logic output bit, said logic output bit and selected other first output bits defining a first count;

clock means generating a clock signal of predetermined frequency;

counter means responsive to said clock signal and operative to count from a reference count;

means operative to compare the count of said counter means with said first count, and to generate a comparator signal in response to an equality therebetween;

means responsive to said comparator signal for resetting said counter means to said reference count;



means coupling said comparator signal to said first circuit means, said first circuit means producing in response to said comparator signal a new pseudo-random bit sequence; and,

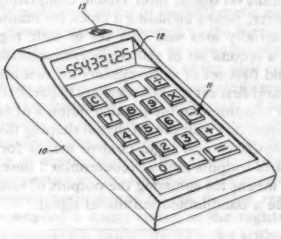
means controlled by said comparator signal to produce successive second output bits defining the pseudo-random code signal.

3,946,216

ELECTRONIC CALCULATOR SYSTEM HAVING SERIAL TRANSFER OF INSTRUCTION WORD FIELDS TO DECODE ARRAYS

Jerry L. Van Dierendonck, Santa Cruz, Calif., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 24, 1973, Ser. No. 400,472
Int. Cl.[2] G06F *13/00*
U.S. Cl. 235—156 **9 Claims**



1. In a calculator system of type having: keyboard input means, display means, and electronic circuitry including a monolithic semiconductor unit having therein a memory for storing data to be operated on, an arithmetic unit included in the semiconductor unit for receiving data from the memory and executing arithmetic functions thereon and returning the data to the memory, the keyboard input means being connected to the semiconductor unit for entering data and functional commands into the calculator system, the display means being connected to the semiconductor unit for providing a visual display of selected data from the memory, and a read-only-memory included in the semiconductor unit for storing a large numer of instruction words for defining the operation of the calculator:

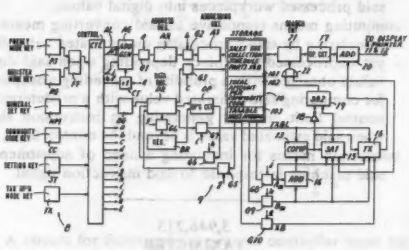
an instruction register connected to receive instruction words from the read-only-memory in parallel upon existence of a load command and to thereafter circulate in serial such instruction word, control means including a first mask programmable logic array located at a position on said semiconductor unit remote from the instruction register for defining the operation of the arithmetic unit in response to a first part of the instruction word, a first register having a serial input and parallel output, a single conductor connecting a part of the instruction register to the serial input of the first register whereby the first part of the instruction word is transferred serially to the first register when the instruction word is circulated in the instruction register, a plurality of parallel conductors connecting the parallel outputs of the first register to the first logic array, the control means also including a second mask-programmable logic array located at a position on said semiconductor unit remote from the instruction register and from the first logic array for defining operation of another unit of the system in response to a second part of the instruction word, a second register having a serial inpuut and a parallel output, another single conductor connecting a part of the instruction register to the serial input of the second register whereby the second part of the instruction register is transferred serially to the second register when the instruction word is circulated in the instruction register, a plurality of parallel conductors connecting the parallel outputs of the second register to the second logic array.

3,946,217

ELECTRONIC CASH REGISTER CAPABLE OF CALCULATING SALES TAX

Atsushi Tsujikawa, and Yoshio Morimoto, both of Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Japan

Filed July 26, 1974, Ser. No. 492,282
Claims priority, application Japan, June 13, 1974, 49-67454
Int. Cl.[3] G06F *7/48*
U.S. Cl. 235—156 **23 Claims**



1. A system for calculating a sales tax imposed upon a total mount of sales based on a predetermined sales tax collection schedule in an electronic cash register which performs a registering operation and provides an electrical signal output representative of said taxable total amount of sales, and which schedule comprises a series of imposable tax values and respectively corresponding ranges of taxable sales amounts including therein a portion comprising a pattern of widths of successive said ranges for corresponding, successive said tax values, said system comprising

storage means for storing said pattern of widths of successive said ranges and corresponding tax values throughout said portion of said collection schedule,

means responsive to an output from said storage means and said electrical signal output of said register representative of said taxable total amount of sales for deducting the largest possible integral number of full cycles of the taxable amount of the repeatedly occurring pattern of said portion from said total amount of sales,

means responsive to an output from said storage means and an output from said deducting means for determining a

first imposable tax value corresponding to said total amount of sales, as deducted by said deducting means,

means responsive to an output from said storage means and an output from said deducting means for multiplying the imposable tax amount for a full cycle of the repeatedly occurring pattern of said portion by said largest possible integral number for providing a second corresponding sales tax value imposable upon said deducted integral number of full cycles of taxable amount of the repeatedly occurring pattern of said first portion, and

means responsive to an output from said determining means and an output from said multiplying means for adding said first and second imposable tax values for providing as an output the total amount of sales tax imposable upon said taxable total amount of sales.

3,946,218

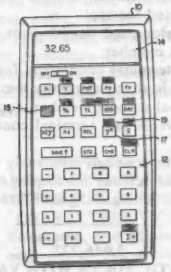
GENERAL PURPOSE CALCULATOR WITH CAPABILITY FOR PERFORMING YIELD-TO-MATURITY OF A BOND CALCULATION

France Rode, Los Altos; William L. Crowley, Jr., Cupertino; Alexander D. R. Walker, Mount View, and David S. Cochran, Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 302,371, Oct. 30, 1972, Pat. No. 3,863,060. This application Oct. 10, 1974, Ser. No. 513,903

Int. Cl.² G06F *15/30*

U.S. Cl. 235—156 **6 Claims**



1. An electronic calculator for calculating the yield to maturity of a bond having a maturity period, a bond price and a coupon rate, said calculator comprising:

a first register for initially storing a first number representing the coupon rate divided by the bond price multiplied by a first selected value;

a second register for initially storing a second number representing the inverse of the bond price multiplied by a second selected value;

a third register for storing a third number having a magnitude greater than one and representing the normalized value of days in the maturity period;

a fourth register for initially storing the contents of the first register;

a fifth register for storing the results of calculations;

a first means coupled to the first, second, third, and fourth registers for combining the contents thereof in accordance with the relation

$$F = R\,\frac{[(1+R)^N - P]}{(1+R)^N - 1} - K,$$

where R is the contents of the fourth register, N is the contents of the third register, P is the contents of the second register, and K is the contents of the first register, said first means being coupled to the fifth register for storing the result of this combination therein;

flag means, coupled to the third register, having set and reset states for indicating when the interest portion of the bond yield has been calculated;

said flag means being set when the accrued interest portion of the bond yield has been calculated;

said flag means being reset in response to the contents of the third register when those contents are greater than a third selected value;

second means coupled to the fourth and fifth registers for subtracting the contents of the fifth register from the contents of the fourth register and for storing the difference in the fourth register, said last-stored contents of the fourth register representing the calculated yield to maturity of the bond;

accruing means coupled to the first means and the first, second, third, and fourth registers for calculating an accrued interest portion of the bond price, for adjusting the contents of the first and second registers to account for the accrued interest portion of the bond price, and for thereafter causing the first means to combine the contents of the third register and the last-stored contents of the first, second, and fourth registers in accordance with said relation and store the result of this combination in the fifth register;

third means, coupled to the flag means and responsive to the contents of the fifth register, for initiating operation of the accruing means when those contents are less than a fourth selected value and when the flag means is in the reset state; and

output means coupled to the fourth and fifth registers and to the flag means for providing a visual output indication of the contents of the fourth register in response to the contents of the fifth register when the contents of the last-mentioned register are less than the fourth selected value and when the flag means is in the set state.

3,946,219

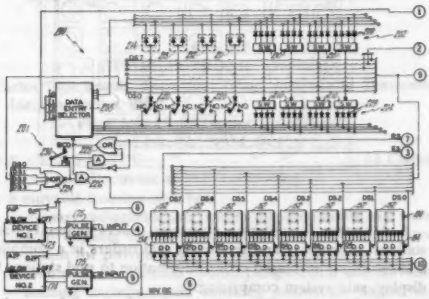
MULTIPLE PURPOSE ELECTRONIC COUNTING SYSTEM

Richard K. Lucas, Enfield, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

Filed Dec. 24, 1974, Ser. No. 536,165

Int. Cl.² G06F *7/38*

U.S. Cl. 235—159 **36 Claims**



1. An electrical core counting circuit comprising count storage means having a plurality of multiple decade BCD storage registers collectively providing a plurality of BCD

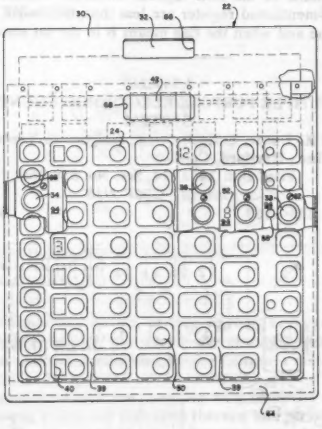
decade sets, each comprising a plurality of corresponding BCD storage decades of the plurality of BCD storage registers respectively, core circuit input connector means for transmitting input signals to the core circuit; and input signal operated control circuit means connected to the input connector means and selectively operable by partitioning input signals applied to the input connector means for selectively operationally dividing the count storage means into a plurality of operationally separate sections thereof, each comprising a selected number of BCD decade sets of ascending order of significance forming BCD storage register sections of the plurality of BCD storage registers respectively each with BCD decades of ascending order of significance; the input signal operated control circuit means being selectively operable by count entry input signals applied to the input connector means for selectively entering a count into each BCD storage register section of a first of said storage registers, and being selectively operable by a plurality of count input trains, of count input signals applied to the input connector means, for the plurality of sections respectively of the count storage means for accumulating separate counts in the register sections respectively of a second of said storage registers by stepping the accumulated count of each second storage register section with each respective count input signal, the input signal operated control circuit means comprising comparator circuit means operable in accordance with the partitioning input signals applied to the input connector means for generating a predetermining signal when the accumulated count in each second storage register section equals the count entered into the respective first storage register section.

3,946,220

POINT-OF-SALE SYSTEM AND APPARATUS

William M. Brobeck, Orinda; John S. Givins, Jr., Berkeley; Philip F. Meads, Jr., Oakland, and Robert E. Thomas, Walnut Creek, all of Calif., assignors to Transactron, Inc., Berkeley, Calif.

Filed June 10, 1974, Ser. No. 477,844
Int. Cl.² G06F *15/02, 15/20*
U.S. Cl. 235—168 **13 Claims**



1. A system for entering customer orders at point-of-sale stations, processing and recording said orders in a computer and returning processed order information to said stations for display, said system comprising:

a. a keyboard terminal at each point-of-sale station, each of said keyboard terminals having

1. a plurality of manually operable keys for designating various sales items as ordered,

2. a plurality of display devices, each of said devices being associated with one manually operable item key,

3. means for generating identifying electrical signals specific to individual keys whenever one of said keys is actuated, and

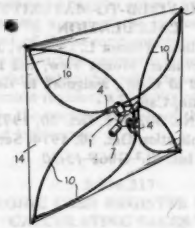
b. a computer interconnecting said keys and said associated display devices and having logic means operative in response to said key identifying signals to cause the display devices associated with the actuated item keys to display the number of sales items ordered.

3,946,221

ORIENTABLE LIGHTING FIXTURE

Sergio Gandini, via Tosio 20, Brescia, Italy

Filed Nov. 25, 1974, Ser. No. 526,836
Claims priority, application Italy, Dec. 21, 1973, 7082/73
Int. Cl.² F21V *17/00*
U.S. Cl. 240—128 **6 Claims**



1. Orientable lighting fixture comprising:

a. a central support member having a plurality of light bulb sockets connected thereto:

b. a plurality of elongated flexible rods connected to said central support member;

c. a plurality of terminal connectors for coupling pars of said flexible rods at the extremity thereof that is remote from said central support member, each said pair of rods converging towards said terminal connector to define a corner; and

d. a pair of screens attached removably onto said terminal connectors, said screens enveloping the entire lighting fixture and functioning as light-diffusors.

3,946,222

AUTOMATIC FOCUS WITH VARIABLE MAGNIFICATION

Melvin E. Swanberg, Claremont, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 18, 1975, Ser. No. 569,423
Int. Cl.² G03B *3/04*
U.S. Cl. 250—201 **9 Claims**

1. A system for automatically focusing images having different magnifications onto a light sensitive medium comprising:

first means for projecting a light image of a wavelength to which the light sensitive medium is responsive along a first optical path from a projection plane to said light sensitive medium, said first optical path including magnification control means for changing the magnification of said light image by changing the length of said first optical path,

second means for automatically focusing said image on said light sensitive medium regardless of changes in the magnification of said light image, said second means including

a. focusing means in addition to said magnification control means situated in said first optical path for changing the length of said first optical path to achieve focus,

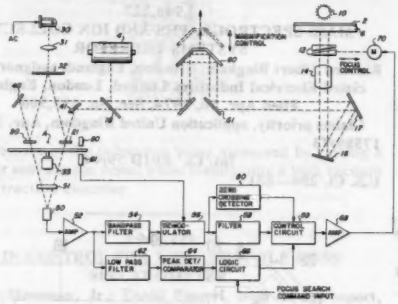
b. means for projecting a first light pattern of a wavelength to which said light sensitive medium is not responsive along a second optical path from a first light

pattern producing means to approximately said projection plane and back to said first light pattern producing means,

c. means for projecting a second light pattern of a wavelength to which said light sensitive medium is not responsive along a third optical path from a second light pattern producing means to approximately said projection plane and back to said second light pattern producing means,

d. said second and third optical paths each including a substantial part of said first optical path including said magnification control means, and said first and second light pattern producing means each having light transmissive portions, and

e. servo means coupled to said focusing means and oriented to receive any portions of said first and second light patterns which have followed said second and third optical paths, respectively, and have passed through the light transmissive portions of said first and second light producing means, respectively, for producing movement of said focusing means in a direction to bring said light image into focus on said light sensitive medium.



3,946,223

CHARGE TRANSFER DEVICE HAVING CONTROL MEANS FOR ITS PHOTOELECTRIC CONVERSION CHARACTERISTICS

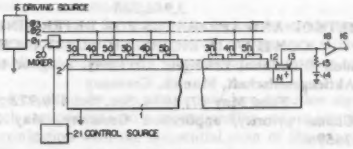
Nozomu Harada, Yokohama, and Mineo Iwasawa, Hayama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Oct. 25, 1974, Ser. No. 518,197

Claims priority, application Japan, Oct. 26, 1973, 48-119996

Int. Cl.² H01L *31/00*

U.S. Cl. 2.. .. J **6 Claims**



1. An operation system to control the photoelectric conversion characteristics of a charge transfer device comprising a semiconductor substrate provided with a plurality of electrodes for carrier integration and transference, integration means for integrating within an integration period the carriers produced in said substrate in increasingly corresponding relationship to the intensity of light incident into said substrate by applying an integration voltage to said electrodes for carrier integration, and transfer and readout means for transferring the integrated carriers by applying when carrier transferring is performed, a transfer voltage to said electrodes for carrier transference and sequentially reading out the transferred carriers as video signals, characterized in that it further comprises means for applying a first integration voltage having a prescribed level to said electrodes for carrier integration during a prescribed length of initial period of said integration period, and means for applying during the remaining integration period a second integration voltage having a level higher than the first integration voltage level at the terminating time point of said initial period to said electrodes for carrier integration.

3,946,224

METHOD AND DEVICE FOR DETECTING THE PASSAGE OF OBJECTS

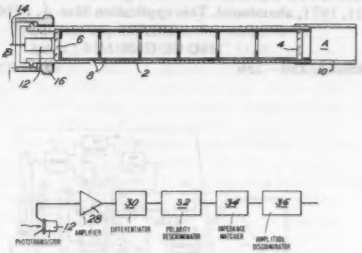
Jean-Louis Allera, Moisans; Jacques Bergeri; Paul Perroud, both of Meylan; Gaetan Pleyber, Domene, and Jean-Louis Violet, Seyssinet-Pariset, all of France, assignors to Commissariat A l'Energie Atomique, Paris, France

Filed Oct. 1, 1974, Ser. No. 510,973

Claims priority, application France, Oct. 8, 1973, 73.35881

Int. Cl.² G01D *21/04*

U.S. Cl. 250—221 **13 Claims**



5. A device for detecting the passage of objects comprising:

a collimator formed of a cylindrical tube which is closed at each end by a transparent window;

a plurality of absorbent shields disposed within the interior of the collimator so as to form a baffle-plate system;

a photoreceiver located at the exit end of the collimator; and

electronic means connected to said photoreceiver for differentiating, amplifying and discriminating the electrical signal at the output of the receiver according to polarity to obtain an ouput signal which is a function of the variations of the luminous flux on said photoreceiver.

3,946,225

OPTOELECTRONIC SWITCH

Carlos Luis Beeck, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed July 29, 1974, Ser. No. 492,625

Int. Cl.² H01J *3/14*

U.S. Cl. 250—237 G **13 Claims**

1. An optoelectronic switch, comprising:

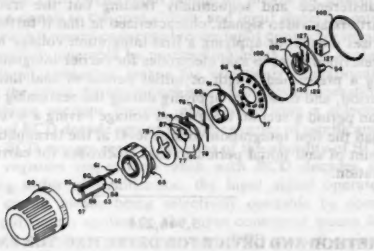
a movable housing member,

stationary radiation source means disposed inside said movable housing member, said stationary radiation source means for providing electromagnetic radiation;

movable masking means operably disposed in said movable housing member, said masking means for selectively masking said electromagnetic radiation to provide a coded electromagnetic radiation; and

stationary radiation sensitive means disposed inside said

movable housing member, said stationary radiation sensitive means for collecting said coded electromagnetic



radiation to provide an output electrical signal proportional to said coded electromagnetic radiation.

3,946,226

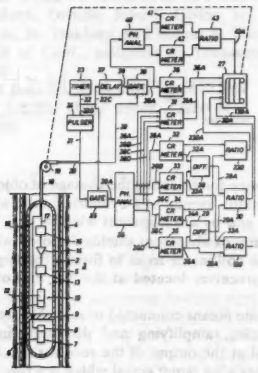
WELL LOGGING METHOD AND APPARATUS

Harry Davis Smith, Jr., Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 322,573, Jan. 10, 1973, Pat. No. 3,796,877, which is a continuation of Ser. No. 145,815, May 21, 1971, abandoned. This application Mar. 4, 1974, Ser. No. 448,091

Int. Cl. G01t 1/16

U.S. Cl. 250—256 7 Claims



1. A method of investigating subsurface earth formations traversed by a borehole comprising the steps of:

repetitively irradiating earth formations in the vicinity of a borehole with pulses of fast neutrons which engage in inelastic scattering interactions with formation nuclei and which are thereafter slowed to thermal energy and engage in further neutron capture interactions with formation nuclei;

detecting, during a first discrete time interval associated with said fast neutron pulses, energy dependent distributions of gamma radiations attributable to the inelastic scattering of fast neutrons by the elements carbon and oxygen in the formations and generating signals representative of carbon inelastic gamma rays and oxygen inelastic gamma rays;

detecting, during a second, later discrete time interval, energy dependent distribution of gamma radiations attributable to the capture of thermal neutrons by the elements calcium and silicon in the formations and generating signals representative of calcium capture gamma rays and silicon capture gamma rays;

generating a first ratio signal comprising a ratio of said carbon and oxygen inelastic gamma ray representative signals;

generating a second ratio signal comprising a ratio of said calcium and silicon capture gamma ray representative signals; and

recording said first and second ratio signals as a function of borehole depth.

3,946,227

MASS SPECTROGRAPHS AND ION COLLECTOR SYSTEMS THEREFOR

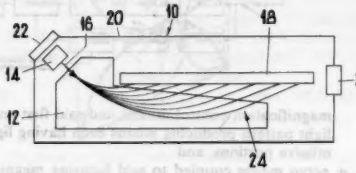
Richard Albert Bingham, Urmston, England, assignor to Associated Electrical Industires Limited, London, England

Filed Apr. 10, 1974, Ser. No. 459,560

Claims priority, application United Kingdom, Apr. 12, 1973, 17589/73

Int. Cl.[2] B01D 59/44

U.S. Cl. 250—281 6 Claims



1. An ion collector system for a mass spectrograph in which ions of different mass-to-charge ratios in an ion beam passing through the spectrograph are focused at different points in a focal plane, comprising a plurality of ion sensitive means that are elongated in a direction generally transverse to said ion beam and are disposed generally parallel to one another in or adjacent to said focal plane, each in the path of ions of substantially only a single mass-to-charge ratio at any given time, said ion sensitive means being responsive to the interception of ions to emit secondary electrons, a plurality of scintillators each disposed adjacent a respective one of the ion sensitive means and substantially alongside the path of said ions, means to bias said scintillators to attract said secondary electrons each substantially only from a respective one of said ion sensitive means, a plurality of light to electricity converters, and a plurality of light-guide means associated one with each scintillator to guide light substantially only from the respective scintillator to a respective one of said light to electricity converters.

3,946,228

METHOD AND APPARATUS FOR DETERMINING GAS CONTENT IN INORGANIC SUBSTANCES

Rudolf Biermann, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed May 17, 1974, Ser. No. 470,972

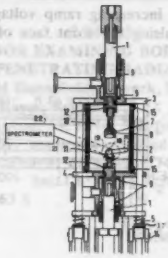
Claims priority, application Germany, May 24, 1973, 2326596

Int. Cl.[3] G01M 7/14

U.S. Cl. 250—282 10 Claims

1. A method for determining the gas content of inorganic, conducting and semiconducting elements and their compounds having a low sublimation temperature, by heating a sample vessel of graphite by direct passage of current, with the sample vessel arranged in an evacuated extraction chamber between two movable current supply electrodes, and analyzing the gas given off by a sample placed in the sample vessel

by mass spectrometry wherein the improvement comprises generating and maintaining a pressure above the sample in the sample vessel which is approximately equal to the saturation



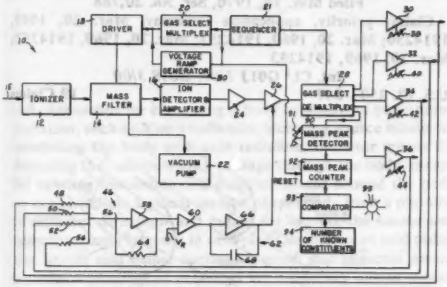
vapor pressure of the substance being measured by placing a filter over said sample vessel while maintaining a high vacuum in the extraction chamber.

3,946,229

GAIN CONTROL FOR A QUADRUPOLE MASS SPECTROMETER

Paul W. Moseman, Jr.; David Passeri, both of Davenport, Iowa, and John P. Carrico, Southfield, Mich., assignors to The Bendix Corporation, South Bend, Ind.

Filed Mar. 29, 1974, Ser. No. 456,325
Int. Cl.² H01J 39/34
U.S. Cl. 250—292 **3 Claims**



1. In a quadrupole mass spectrometer wherein a gaseous mixture is sequentially scanned to obtain a measurement of the relative abundance of each component thereof, control means for automatically compensating for variations in ionization, gas transportation and detection efficiencies of said gaseous mixture to continually obtain an accurate analyzation, said control means comprising:

first amplifier means for generating an ion detection signal representative of each component in said gaseous mixture as established through the scanning of the gaseous mixture;

demultiplex means for converting said ion detection signal for each component into a corresponding output signal in synchronization with the sequential scan of the gaseous mixture;

channel means for communicating said output signal to an indicator means to inform an operator of said relationship of each component in said gaseous mixture;

adjustment means associated with said channel means for modifying the output signal of a known gas sample presented to an ionizer to calibrate said indicator means;

first resistor means connected to said channel means for reducing each of said output signals to produce a proportional output signal corresponding to the concentration of each gas in the gaseous mixture;

junction means connected to said first resistor means for combining said proportional output signal of each of said components to produce a component signal;

second amplifier means connected to said junction means for increasing the amplitude of said component signal;

second resistor means associated with said second amplifier means for controlling the gain of the component signal;

comparator means connected to said second amplifier means for comparing said component signal with a reference signal to establish an error signal; and

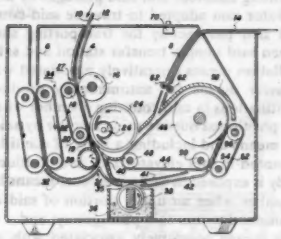
integrator means having a ramp amplifier and a capacitor means responsive to said error signal for establishing a gain signal for proportionally modifying each of said ion detection signals from said first amplifier means in a manner such that the component signal is brought into equalization with said reference signal in a series of uniform steps.

3,946,230

COPY METHOD UTILIZING SINGLE RADIANT RAY PATH FOR IMAGING AND TRANSFIXING

William A. Sullivan, Jr., Webster, N.Y., and Roger H. Eichorn, deceased, late of Rochester, N.Y. (by Lincoln First Bank of Rochester, executor), assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 27, 1973, Ser. No. 428,976
Int. Cl.² B41M 5/00; G03C 5/16
U.S. Cl. 250—316 **13 Claims**



1. A method for thermographically reproducing a copy of an image borne by an original; said method comprising the steps of:

forming a sandwich containing a heat sensitive member and said original;

advancing the sandwich past a radiant source to thermally impart said image to said heat sensitive member in response to radiant energy supplied by said source via a predetermined path;

separating the original from said heat sensitive member;

advancing the heat sensitive member through a development station to develop the image imparted thereto;

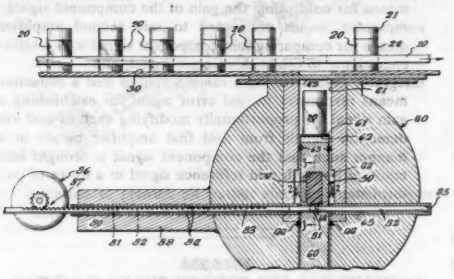
looping the heat sensitive member back toward said radiant source while retaining a predetermined edge of said heat sensitive member as its leading edge; and

advancing the heat sensitive member past said radiant source for a second time to expose the developed image thereon to radiant energy supplied by said source via said predetermined path.

3,946,231
LIQUID SCINTILLATION COUNTING SYSTEM WITH AUTOMATIC GAIN CORRECTION

Richard B. Frank, Deerfield, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed June 12, 1968, Ser. No. 736,537
Int. Cl.² G01T 7/08
U.S. Cl. 250—328 **9 Claims**



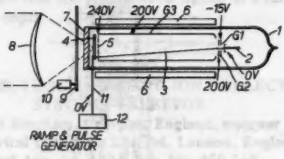
1. In an automatic liquid scintillation counting system,
conveyor means for delivering a plurality of liquid scintillation samples to a sample transfer station;
shielding means positioned adjacent same sample transfer station and defining a counting chamber spaced from said station and a passageway interconnecting said station and said chamber;
transducer means associated with said counting chamber for converting scintillations within said chamber into electrical pulses corresponding in amplitude to the intensities of said scintillations;
sample transfer means operatively associated with said counting chamber and said passageway and including an elevator ram adapted to traverse said counting chamber and said passageway for transporting said samples between said sample transfer station and said chamber;
scintillation means operatively associated with said sample transfer means for automatically producing reference scintillations in said counting chamber when said samples are positioned outside said chamber by said sample transfer means and including a body of scintillating phosphor mounted in said elevator ram in a position such that said body is exposed to said transducer means in said counting chamber when an upper portion of said elevator ram is positioned within said passageway; and
circuit means operatively associated with said transducer means for automatically adjusting the gain of said counting system in accordance with said reference scintillations.

3,946,232
PYROELECTRIC CAMERA TUBES

Alan Lewis Harmer, Chelmsford, England, assignor to English Electric Valve Company Limited, Chelmsford, England

Filed Oct. 25, 1974, Ser. No. 518,167
Claims priority, application United Kingdom, Oct. 29, 1973, 50154/73
Int. Cl.² H01J 31/49
U.S. Cl. 250—333 **18 Claims**

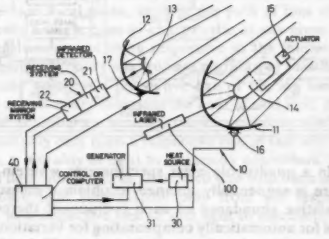
1. The method of operating a pyroelectric camera tube having a high resistivity target presenting a front face from which video signal are read off, a rear face adapted to be scanned by an electron beam, and cathode means for producing the electron beam, which comprises the steps of:
a. operating the pyroelectric camera tube under conditions which establish cathode potential stabilized mode of operation thereof;
b. during step (a), applying an increasing ramp voltage to the front face of the target of the pyroelectric camera tube while scanning the rear face of the target with the electron beam, and controlling the rate of increase of the ramp voltage with respect to the energy spread of the scanning electron beam so as to produce a pedestal voltage during the cathode potential stabilized mode of operation;
c. terminating the increasing ramp voltage at a selected potential and pulsing the front face of the target in a positive direction relative to the cathode to operate the tube in anode potential stabilized mode until the potential of the rear face of the target is raised to said selected potential; and then
d. pulsing the front face of the target negatively with respect to the cathode so that the tube is returned to cathode potential stabilized mode.



3,946,233
WEAPON SYSTEM FOR THE DETECTION OF AND USE AGAINST STATIONARY OR MOVING OBJECTS

Klaus Dieter Erben; Walter Kroy, both of Munich, and Walter Erich Mehnert, Ottobrunn, all of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Mar. 18, 1970, Ser. No. 20,788
Claims priority, application Germany, Mar. 20, 1969, 1914250; Mar. 20, 1969, 1914251; Mar. 20, 1969, 1914252; Mar. 20, 1969, 1914253
Int. Cl.² G01J 1/00; H01S 3/00
U.S. Cl. 250—347 **19 Claims**



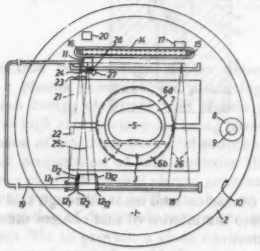
1. A system for detecting the presence of and inflicting damage on a stationary or moving object, comprising:
controllable carbon dioxide gas infrared laser means for producing an output beam of infrared radiation in the wave range of 8 to 11 microns, the magnitude of power contained in said output beam being controllable between a low output power level for a scanning and a high output power level for inflicting damage;
adjustable lense means in the path of said infrared radiation for controllably directing said infrared radiation for scanning a given zone;
detector means for locating said object in said zone by detecting infrared radiation reflected from said object and producing a signal;
control means for (1) effecting an adjustment of said adjustable lense means in response to said signal to maintain a directing of said infrared radiation at said object and for (2) effecting a change of the power level of said laser

means from said low power level to said high power level to inflict damage on said object.

3,946,234
APPARATUS FOR EXAMINING BODIES BY MEANS OF PENETRATING RADIATION

Godfrey Newbold Hounsfield, Newark, England, assignor to E M I Limited, Hayes, England

Filed Aug. 30, 1974, Ser. No. 502,080
Claims priority, application United Kingdom, Aug. 31, 1973, 41191/73; Feb. 2, 1974, 4928/74
Int. Cl.² G01T 1/20
U.S. Cl. 250—363 S **9 Claims**



1. Apparatus for examining a body by means of penetrating radiation, such as X or γ radiation, including source means for irradiating the body with said radiation, detector means for detecting the radiation after passage through the body, means for orbiting the source and detector means around the body so as to irradiate a planar section of said body from a plurality of different directions and means for moving the source and detector means laterally in said plane so as to scan said radiation across said planar section, wherein said detector means includes a plurality of detectors for producing output signals respectively related to the radiation incident at different angles within a sector of radiation emanating from said source, wherein linking means links said source means to said detector means to substantially prevent relative movement between said detectors and said sector of radiation and wherein said orbiting means moves the said source and detector means at an angular rate which takes account of the angle subtended by said sector.

3,946,235
HELIUM RESONANCE LAMP AND A LEAK DETECTION SYSTEM USING THE LAMP

Robert A. Young, R.R. No. 2, Loretto, Ontario, Canada

Division of Ser. No. 488,184, July 12, 1974, Pat. No. 3,904,907. This application Feb. 18, 1975, Ser. No. 550,561
Int. Cl.² G01J 1/42
U.S. Cl. 250—373 **4 Claims**

1. Apparatus for detecting gas leaks by the helium leak method in a system comprising

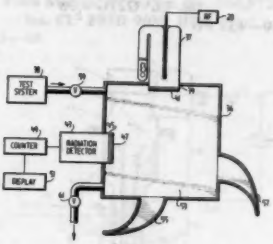
a helium resonance lamp having an emission at 584A;

a window in said lamp partially transparent to 584A radiation;

a helium resonance radiation detector;

a chamber incorporating said helium lamp and helium resonance radiation detector;

means for supplying RF power to the He lamp; and

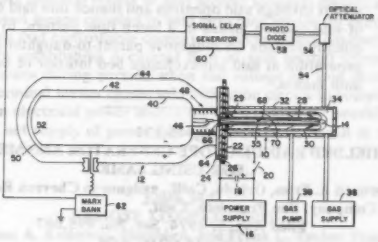


means connected to said detector for displaying the output from said detector.

3,946,236
ENERGETIC ELECTRON BEAM ASSISTED X-RAY GENERATOR

Thomas G. Roberts; Romas A. Shatas; Harry C. Meyer, III, and John D. Stettler, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 4, 1974, Ser. No. 457,865
Int. Cl.² G21G 4/00
U.S. Cl. 250—402 **9 Claims**



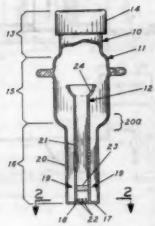
1. An electron beam assisted x-ray generator comprising a plasma generator for producing a plasma, a source of high energy electrons, said plasma generator and said source of high energy electrons being mounted coaxially for transmission of electrons from said source of high energy electrons and propagation of said electrons through a bore within an inner electrode of said plasma generator, high Z material in said plasma generator for seeding said plasma, and control means for said plasma generator and said source of high energy electrons for causing x-rays to be produced from direct interaction and bombardment of the plasma produced by the plasma generator and said electrons from said source of high energy electrons when said plasma has been seeded with said high Z material, said control means being such as to cause said electrons to have their space charge neutralized when they enter said bore and to be guided by interaction of their magnetic field with an inner surface of said bore to deliver said electrons to said plasma.

3,946,237

SUPPORT HOUSING FOR RADIOISOTOPE GENERATION

Bernard A. Fries, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 5, 1974, Ser. No. 495,006
Int. Cl.² G21G 4/08
U.S. Cl. 250—432 PD **6 Claims**



1. Housing for on-site radioactive parent-to-daughter isotope generation in which said parent radioisotope absorbed on an ion-exchange bed is selectively contacted with an eluting reagent to generate a short-lived daughter radioisotope, comprising:

i. bottle means having mouth and a central repository defined by a side wall and a bottom wall,

ii. a cylindrical column means positioned within said repository of said bottle means by attachment to said bottom wall of said bottle means, and including means attached at its interior suitable for support of said ion-exchange bed,

iii. said column means also including a series of openings through its side wall adjacent to said bottom wall of said bottle means whereby said eluting reagent during initialization of the process can be conveyed from a position exterior of said column means but interior of the bottle means through said openings and thence into said interior of said column means in a batch flow pattern, to subsequently provide for radioative parent-to-daughter isotope generation at said ion-exchange bed interior of said column means.

3,946,238

SHIELDED RADIOISOTOPE GENERATOR AND METHOD FOR USING SAME

Bernard A. Fries, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 5, 1974, Ser. No. 495,007
Int. Cl.² G21G 4/08
U.S. Cl. 250—432 PD **11 Claims**

1. A shielded radionuclide generator for on-site radioactive parent-to-daughter isotope generation in which said parent radioisotope absorbed on an ion-exchange bed is selectively contacted with an eluting reagent to generate said short-lived daughter isotope comprising:

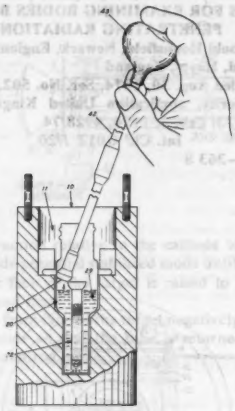
i. shield means formed of a radiation-resistive material and including an entryway and a central repository defined by said entryway, including a side wall and a bottom wall,

ii. a nuclide generator positioned within said repository of said shield means for generating said short-lived daughter isotope,

iii. said nuclide generator including bottle means having a mouth and a central cavity defined by a side wall and a bottom wall,

iv. a cylindrical column means positioned within said cavity of said bottle means by attachment to said bottom wall of said bottle means and including means attached to its interior suitable for support for said ion-exchange bed,

v. said column means also including a series of openings through its side wall adjacent to said bottom wall of said bottle means whereby said eluting reagent, at least during initialization of the process, is conveyed from locations



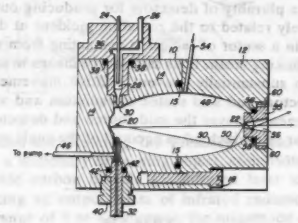
exterior of said column means through said openings and thence into the interior of said column means in a batch flow pattern.

3,946,239

ELLIPSOIDAL CELL FLOW SYSTEM

Gary C. Salzman, and Paul F. Mullaney, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United Energy Research and Development Administration, Washington, D.C.

Filed Jan. 24, 1975, Ser. No. 544,026
Int. Cl.² G01N 21/38
U.S. Cl. 250—461 B **4 Claims**



1. A cell flow and fluorescence detector comprising;

an essentially ellipsoidal flow chamber having primary and secondary foci and having walls at least somewhat reflective in a selected portion of the spectrum;

means for passing cells through said primary focus;

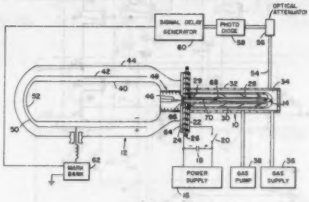
means for illuminating said cells at said primary focus so that the light after passing through said cells impinges on and reflects from said walls; and

means for detecting said reflected light at said secondary focus as modulated by the cells passing through said primary focus.

3,946,240
ENERGETIC ELECTRON BEAM ASSISTED FUSION NEUTRON GENERATOR

Thomas G. Roberts; Romas A. Shatas; Harry C. Meyer, III, and John D. Stettler, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 4, 1974, Ser. No. 457,941
Int. Cl.² G21G 4/02
U.S. Cl. 250—493 6 Claims

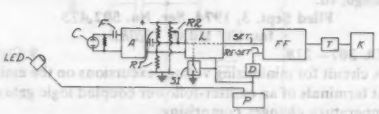


1. An electron beam assisted fusion neutron generator comprising a plasma generator for producing a plasma, a source of high energy electrons, said plasma generator and said source of high energy electrons being mounted coaxially for transmission of electrons from said source of high energy electrons and propagation of said electrons through a bore within an inner electrode of said plasma generator, a chamber in said plasma generator that is filled with gases selected from the group consisting of deuterium-tritium, deuterium, tritium and deuterium ^3He to provide a clean environment for said plasma, and control means for said plasma generator and said source of high energy electrons for causing neutrons to be produced from direct innteraction of the plasma produced by the plasma generator and said electrons from said source of high energy electrons, said control means being such as to cause said electrons to have their space charge neutralized when they enter said bore and to be guided by inneraction of their magnetic field with an inner surface of said bore to deliver said electrons to said plasma.

3,946,241
LIGHT DETECTOR WITH PULSED LIGHT SOURCE AND SYNCHRONOUS DATA GATING

William J. Malinowski, Pembroke, Mass., assignor to Pyrotector, Incorporated, Hingham, Mass.

Continuation-in-part of Ser. No. 419,206, Nov. 26, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 568,015
Int. Cl.² G01N 21/26
U.S. Cl. 250—574 8 Claims

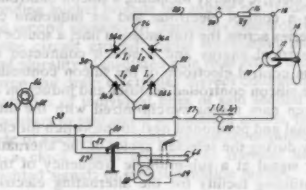


1. In a detector of the type utilizing a pulsing light source and means for producing a signal pulse in response to the pulsed light under prdetermined conditions, the improvement compris'ng a level detector having an input connected to the output of the signal pulse producing means, said level detector producing an output signal only in response to an input signal pulse above a predetermined value, the output of the level detector being connected to an alarm actuating device, means rendering said level detector incapable of producing an output signal when the light source is de-denergized and rendering said level detector capable of producing an output signal only when the light source is emitting light.

3,946,242
GEOPHYSICAL ENERGY SOURCE UTILIZATION CIRCUIT

Alan W. Wilkerson, 410 Madero Drive, Thiensville, Wis. 53092

Filed Mar. 3, 1975, Ser. No. 554,972
Int. Cl.² F03D 9/00; H02J 3/40
U.S. Cl. 307—45 46 Claims



1. A geophysical energy source utilization circuit suitable for energizing an a.c. load coupled to a.c. power mains comprising:

conversion means responsive to the energy of the geophysical source for converting the energy in a corresponding amount of d.c. electrical power having a unipolarity voltage characteristic and for providing same to output terminals of the conversion means;

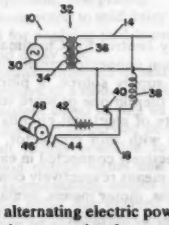
switching means having a first terminal means coupled to said output terminals of said conversion means and a second terminal means connectable to said a.c. load and across the a.c. power mains for receiving a periodically varying voltage from the a.c. power mains, said switching means including controllable current conduction means interposed between the first and second terminal means for allowing the polarity of the unipolarity voltage to remain unchanged and for conducting current from said first terminal means to said second terminal means; and

control means coupled to said switching means for rendering said controllable current condition means conductive for establishing a current flow at said second terminal means during periods when the voltage on said second terminal means causes said utilization circuit to comprise an electrical power source for the a.c. load for providing a net supply of power from the utilization circuit to the a.c. load.

3,946,243
REMOTE LOAD CONTROL

Clarence A. Anderson, Dearborn, and Frank L. Taylor, Franklin, both of Mich., assignors to The Detroit Edison Company, Detroit, Mich.

Filed Nov. 2, 1964, Ser. No. 408,301
Int. Cl.³ H01M 11/04
U.S. Cl. 307—140 8 Claims



1. A source of an alternating electric power signal including an alternating electric power signal generator, a transformer having a primary winding connected to receive the alternating electric power signal output of the alternating electric power

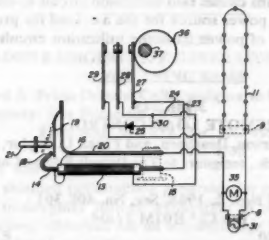
generator and a secondary winding, a transmission line for alternating electric power, the secondary winding of the transformer being connected to the transmission line for transmitting alternating electrical energy from the generator over the transmission line, means for periodically placing a load across the transmission line at a frequency which is a sub-multiple of the frequency of the alternating electric signal and synchronized with the alternating electric signal for withdrawing power only from separated individual selected cycles of the alternating electric energy including a silicon controlled rectifier having a control electrode and an induction coil connected in series across the transmission line, a source of direct current electrical energy and a switch connected in series between the control electrode of the silicon controlled rectifier and the silicon controlled rectifier and induction coil, and motor driven cam means synchronized with the alternating electric signal and positioned next to the switch for closing the switch only during the selected cycles of the alternating electric power signal at a sub-multiple frequency of the power signal, a utilizing facility for the alternating electric power signal connected to the distribution line and means for detecting the periodic withdrawal of power from the alternating electric power signal at the utilizing facility and providing a control signal for the utilizing facility in accordance therewith including a rectifier connected across the distribution line, a resonant circuit connected to the rectifier resonate at the sub-multiple frequency of the withdrawal of power from the alternating electric power signal, and switch means responsive to the resonant circuit for effecting a control function on resonance of the resonant circuit.

3,946,244

CHRISTMAS TREE LIGHTING CONTROL

George B. Davis, Jr., 7512 Marbury Road, Bethesda, Md. 20034

Continuation-in-part of Ser. No. 418,262, Nov. 23, 1973. This application Jan. 21, 1975, Ser. No. 542,803
Int. Cl.² H05B *37/00*
U.S. Cl. 307—31 **11 Claims**



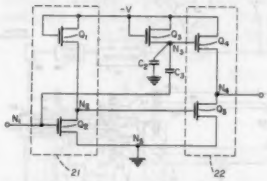
1. A light intensity control for Christmas tree lighting including in combination connector means for connecting said control to a power supply source, a plurality of electrical outlets for receiving therein one or more strings of Christmas tree lights, a plurality of electrical circuits respectively connecting said outlets with said connector, voltage dropping resistor means, respectively connected in each of said connector circuits, rectifier means respectively connecting in each of said connector circuits, motor means, contact means movable by said motor means to intermittently short out, in predetermined sequence, said resistor means and said rectifier means to alter in predetermined increments voltage applied from said connector to said outlets.

3,946,245

FAST-ACTING FEEDFORWARD KICKER CIRCUIT FOR USE WITH TWO SERIALLY CONNECTED INVERTERS

Michael J. McClaughry, Rosemont, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Feb. 12, 1975, Ser. No. 549,603
Int. Cl.² H03K *19/08, 17/04, 17/10, 17/60*
U.S. Cl. 307—205 **20 Claims**



20. A serial inverter circuit having:
an input;
an output;
a voltage source node;
a circuit reference node;
a first inverter formed by a first load field-effect transistor and a first input field-effect transistor, the first load transistor having its gate connected to the voltage source node and its drain-source path connected between the voltage source node and a common node, and the first input transistor having its drain-source path connected between the common node and the circuit reference node and its gate connected to the input;
a second inverter formed by a second load field-effect transistor and a second input field-effect transistor, the second load transistor having its drain-source path connected between the voltage source node and the output, the second input transistor having its drain-source path connected between the output and the circuit reference node and its gate connected to the common node;
an isolating field-effect transistor having its drain-source path connected between the voltage source node and the gate of the second load transistor, and having its gate connected to the voltage source node; and
a capacitor connected between the input and the gate of the second load transistor.

3,946,246

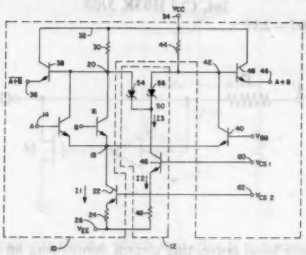
FULLY COMPENSATED EMITTER COUPLED LOGIC GATE

Robert R. Marley, Phoenix, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Sept. 3, 1974, Ser. No. 502,473
Int. Cl.² H03K *19/08*
U.S. Cl. 307—218 **9 Claims**

1. A circuit for minimizing voltage excursions on the emitter output terminals of an emitter-follower coupled logic gate due to temperature changes comprising:
a. an emitter-follower current switch logic gate having at least one input switching transistor and a reference transistor;
b. a first common node and a first current source connected thereto for providing current for either said input switching transistor or said reference transistor;
c. said first common node being connected to the emitter terminals of said input switching transistor and said reference transistor;
d. a second node connected to the collector terminal of said input switching transistor, and a first impedance means connected between said second node and a first supply means,

e. a third node connected to the collector of said reference transistor, and a second impedance means connected between said third node and the first supply means;
f. first and second emitter-follower output transistors connected at their base terminals to said second and third nodes, respectively;
g. the emitter terminals of said first and second emitter-follower output transistors being responsive to logical input signals at the base terminal of said input switching transistor for generating predetermined logical output signals;
h. circuit means connected to said second and third nodes for minimizing voltage excursions of the logical output



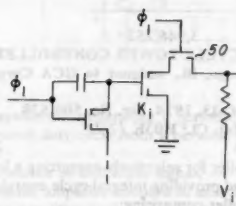
signals being generated from a predetermined one of said emitter follower output transistors having its base terminal connected to the collector terminal of a nonconducting input switching transistor or a nonconducting reference transistor, and
i. said circuit means comprising a second current source for continuously generating a predetermined amount of current,
j. switching means connected to said second current source and to said second and third nodes for selectively applying said predetermined amount of current only to said second or said third node.

3,946,247

ANALOGUE SHIFT REGISTER CORRELATORS

Dean Robert Collins, and Lewis T. Clairborne, both of Dallas, Tex., assignors to Texas Instruments Inc., Dallas, Tex.

Filed Nov. 5, 1971, Ser. No. 196,043
Int. Cl.² H03K 5/159; G11C 19/28; H01L 27/10, 29/78
U.S. Cl. 307—221 D **1 Claim**



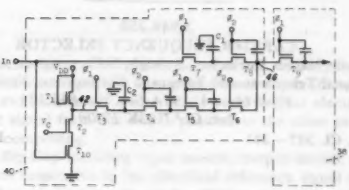
1. A charge transfer device correlator comprising:
a. a semiconductor substrate of one conductivity type;
b. a bucket brigade configuration of first insulated gate field effect transistors defined on one surface of said substrate defining a plurality of bits;
c. means for applying clocking pulses to respective gates of said first field effect transistors for entering data and propagating said data in shift register fashion along said bucket brigade; and
d. data sampling and amplitude weighting means for simultaneously detecting the data stored at each of said plurality of bits and weighting said signals in a preselected manner, said data sampling and amplitude weighting means including a second plurality of insulated gate field effect transistors respectively disposed in said substrate adjacent a corresponding bit of said bucket brigade, the gate electrode of said second plurality of transistors ohmically connected to the source region of the corresponding transistor of said bucket brigade bit, each of said second plurality of transistors defining a predetermined gain for weighting the amplitude of the signal stored in the corresponding bucket brigade bit, source electrodes of each of said second plurality of transistors commonly connected to the circuit ground; signal summation means; and a third plurality of insulated gate field effect transistors, the source and drain electrodes thereof connecting the drain electrodes of individual ones of said second plurality of transistors to said signal summation means, the gate electrode of each of said third transistors disposed for receiving a clock signal effective to transfer detected and weighted signals to said summation means.

3,946,248

DISPERSION COMPENSATED CIRCUITRY FOR ANALOG CHARGED SYSTEMS

Dennis Darcy Buss, Richardson, Tex., assignor to Texas Instruments Inc., Dallas, Tex.

Division of Ser. No. 320,347, Jan. 2, 1973, Pat. No. 3,868,516.
This application July 12, 1974, Ser. No. 486,536
Int. Cl.² H01L 27/10, 29/78; G11C 11/40
U.S. Cl. 307—221 D **8 Claims**

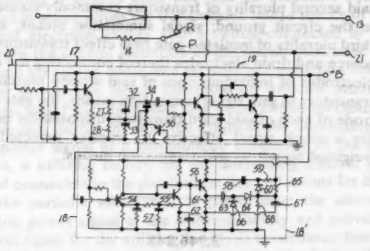


1. A charge transfer device analog delay line having a series of delay stages, each characterized by a predetermined delay and means for shifting input signals between said delay stages, said delay line having an output substantially free from charge transfer loss dispersion, comprising:
input means connected to said delay line for receiving input signals and for applying said input signals to a first delay stage of said delay line;
first circuit means connected to said input means for generating, responsive to a said input signal, a dispersion compensation output singal having an amplitude equal to the inverse of the total dispersion of said delay line; and
second circuit means operable to delay said dispersion compensation output signal and to apply said delayed dispersion compensation output signal to said first delay stage of said delay line delayed by said predetermined delay relative to application of said input signal by said input means to said first delay stage of said delay line for combination with an input signal at said first delay stage.

3,946,249
SIGNAL CONTROL CIRCUIT

Masaru Nagami, and Osami Niino, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 11, 1973, Ser. No. 359,217
Claims priority, application Japan, May 13, 1972, 47-56182[U]
Int. Cl.² H03K 17/00
U.S. Cl. 307—233 A **11 Claims**



1. A circuit comprising:

A. a rectifier to rectify lower frequency components of an incoming signal to produce an output signal having a predetermined polarity;

B. a smoothing filter connected to said rectifier for smoothing out rapidly changing portions in said output signal;

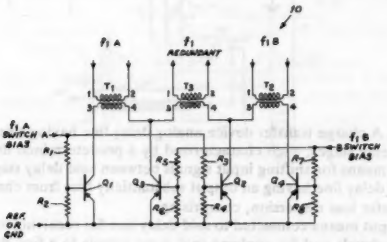
C. an output terminal connected to said filter for receiving said output signal therefrom; and

D. circuit means nonresponsive to said lower frequency components to connect only rapidly changing portions of said incoming signal to said output terminal in said predetermined polarity regardless of the polarity of said rapidly changing portions.

3,946,250
CARRIER FREQUENCY SELECTOR

Claude Melvin Hurlocker, Raleigh, N.C., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Mar. 4, 1974, Ser. No. 448,121
Int. Cl.² H03K 17/00
U.S. Cl. 307—241 **15 Claims**



1. A redundant carrier frequency selection arrangement for a frequency division multiplex communication system comprising:

first means to provide *n* pairs of carrier frequencies, where *n* is an integer including one, each carrier frequency of each pair of said *n* pairs of carrier frequencies are equal and said carrier frequencies of each pair of said *n* pairs of carrier frequencies are different;

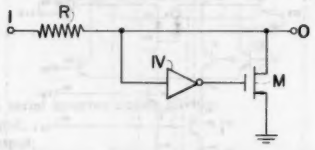
n plurality of second means each requiring a carrier frequency coupled to said first means and each plurality of second means of said *n* plurality of second means responding to a different pair of said *n* pairs of carrier frequencies; and

an electronic switching means disposed in each of said *n* plurality of second means to select either one of said carrier frequencies of an associated pair of said *n* pairs of carrier frequencies.

3,946,251
PULSE LEVEL CORRECTING CIRCUIT

Hiroto Kawagoe, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Sept. 5, 1973, Ser. No. 394,456
Claims priority, application Japan, Oct. 4, 1972, 47-99016
Int. Cl.² H03K 5/08
U.S. Cl. 307—237 **7 Claims**



1. A pulse level correcting circuit comprising an input and an output terminal, pulse signal means connected to said input terminal for supplying thereto a pulse signal having a first and a second voltage level, impedance means interposed between said input terminal and output terminal of said correcting circuit for transferring said pulse signal to said output terminal so that the output signal has the two voltage levels which are substantially the same as said first and second voltage levels, and a branch line including switching means for causing a current to flow through said impedance means when the level of the input pulse signal applied to said input terminal corresponds to said first level, said branch line being arranged between one side of said impedance means and a reference voltage terminal the voltage of which is substantially the same as said first voltage level, whereby the level of said input pulse is improved by the voltage drop across said impedance element during current flow, wherein said branch line further includes an inverter connected between one of the terminals of said impedance means and an input electrode of said switching means, and wherein said switching means comprises a MOS FET device having its gate electrode connected to the output of said inverter, its drain electrode directly connected to said output terminal and its source electrode directly connected to said reference voltage terminal.

3,946,252
INTEGRAL CYCLE POWER CONTROLLER

Peter Juodikis, Chicago, Ill., assignor to GCA Corporation, Bedford, Mass.

Filed Sept. 23, 1974, Ser. No. 508,538
Int. Cl.² H03K 17/72
U.S. Cl. 307—252 B **2 Claims**

1. A power controller for selectively energizing a load from an a.c. supply line and providing integral cycle energization of the load, said controller comprising:

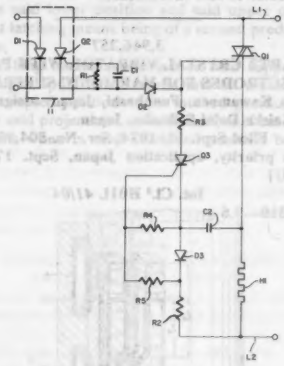
a triac connected in series with the load across the a.c. supply line;

means for selectively triggering said triac on those a.c. halfcycles when the line voltage is of a first polarity, the triac being oriented to be triggered in its first quadrant;

a capacitor, one side of which is connected to a junction between the series-connected triac and load;

circuit means including a diode and a current limiting resistor connecting the other side of said capacitor to the load side of the a.c. supply line for charging said capacitor when said load is energized on said a.c. half-cycles of first polarity; an SCR, the cathode of which is connected to a

junction between said diode and said capacitor and the anode of which is connected to the gate of said triac; and means for applying the voltage developed across said diode to the gate-cathode circuit of said SCR thereby to trigger said SCR on the half-cycle following a half-cycle of said



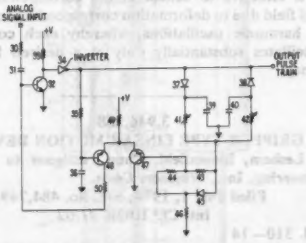
first polarity during which said triac is triggered, whereby said capacitor is discharged through the anode-cathode circuit of said SCR into the gate of said triac and said triac is triggered in its third quadrant to provide integral cycle energization of the load.

3,946,253

PULSE TRAIN GENERATOR

Bjorn Ragnar Solberg, Oslo, Norway, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 2, 1974, Ser. No. 494,243
Claims priority, application Italy, Oct. 26, 1973, 30589/73
Int. Cl.² H03K *17/00*
U.S. Cl. 307—261 **16 Claims**



1. A system for generating a periodic pulse train with any fixed desired duty cycle from a periodic input signal comprising:

a first source of said input signal;

a transistor amplifier coupled to said first source, said transistor amplifier having a bias which can be varied;

an amplifying element direct current coupled to an output of said transistor amplifier, said amplifying element having a voltage swing limited in a predetermined manner to provide said periodic pulse train;

a first low pass filter coupled to said amplifying element to low pass filter said periodic pulse train;

a second source of a reference voltage; and

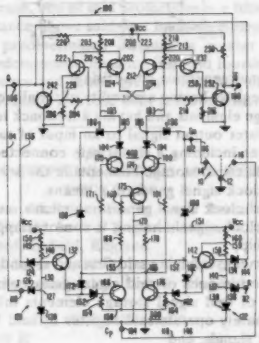
a comparison amplifier coupled to said first low pass filter, said second source and said transistor amplifier to compare the output voltage of said first low pass filter with said reference voltage to produce a difference voltage for coupling to said transistor amplifier to vary said bias of said transistor amplifier to render the value of the output voltage of said first low pass filter very close to the value of said reference voltage.

3,946,254

NO-BOUNCE ELECTRONICALLY CONTROLLED SWITCH CIRCUIT

Lawrence A. Millben, Detroit, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 2, 1974, Ser. No. 494,318
Int. Cl.² H03K *17/00*
U.S. Cl. 307—268 **10 Claims**



1. A circuit for producing a single noise-free output pulse of a predetermined logic state in response to actuation of bi-positionable switch means for alternately supplying an electrical reference signal from one switch position to the other switch position, comprising:

a first flip-flop including input means, output means, and means responsive to the electrical reference signal supplied to the one position of said bi-positionable switch means for setting the logic state of said first flip-flop output means to a predetermined logic state;

a second flip-flop including output means coupled to said first flip-flop logic state setting means for maintaining a first predetermined logic state at said second flip-flop output means only while said bi-positionable switch means remains at said one switch position and input means responsive to the predetermined logic state of said first flip-flop output means for establishing a second predetermined logic state at said second flip-flop output means during actuation of said bi-positionable switch means toward the other switch position;

means for coupling said second flip-flop output means with said first flip-flop input means for reversing the set predetermined logic state of the first flip-flop output means in response to the established second predetermined logic state at said second flip-flop output means only upon arrival of said bi-positionable switch means at said other switch position; and

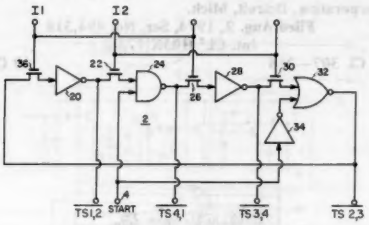
means for preventing said second flip-flop from reversing said established second predetermined logic state at said second flip-flop output means to said first maintained predetermined logic state while said first flip-flop output means is in said set predetermined logic state.

3,946,255

SIGNAL GENERATOR

Jeffrey P. Stein, Hatfield, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 25, 1974, Ser. No. 463,896
Int. Cl.² H03K 5/15
U.S. Cl. 307—269 8 Claims



1. A signal generator comprising:

a shift register having a plurality of serially connected signal storage elements and having a feedback loop for applying a register output signal to an input of said register, said register including a signal gate connected between each of said signal storage elements in the serial array,

a first clock signal generating means,

a second clock signal generating means, said first and second clock signals having a non-overlapping phase relationship,

circuit means applying said first and second clock signals to respective ones of said signal gates connected between each of said signal storage elements in said register to alternately operate said register by said first and second clock signals, and

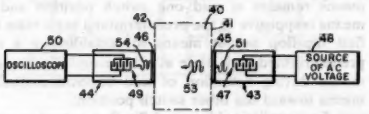
output means connected to predetermined ones of said signal storage elements and to said first and second clock signals to produce an output signal from said predetermined ones of said signal storage elements in response to a concurrent presence of an output signal from a respective one of said signal storage elements and a respective one of said first and second clock signals.

3,946,256

SYSTEM FOR GENERATING OR SENSING TRANSVERSE ELASTIC BULK WAVES IN SOLIDS

Clifford K. Day, Richland, Wash., and George G. Koerber, Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Dec. 10, 1971, Ser. No. 206,667
Int. Cl.² H01L 41/04
U.S. Cl. 310—9.5 10 Claims



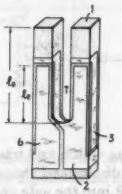
1. In combination, a solid test material for supporting bulk shear waves and having an exterior surface; a transducer of piezoelectric material having at least a two-fold axis of symmetry and first and second intersecting surfaces parallel to said two-fold axis; said first surface of said transducer coupled to said exterior surface of said test material; electrode means on said second surface of said transducer; and source means for exciting said electrode means to generate a transverse surface wave on said second surface of said transducer and propagating in a direction perpendicular to said two-fold axis, said surface wave also extending into the body of said transducer and propagating toward said first surface as a deep surface wave characterized in that its intensity will attenuate to $1/e$ of its surface intensity value at a distance substantially greater than the thickness of said transducer along a direction perpendicular to said first surface.

3,946,257

QUARTZ CRYSTAL VIBRATOR WITH PARTIAL ELECTRODES FOR HARMONIC SUPPRESSION

Yasukazu Kawamura, Funabashi, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Sept. 11, 1974, Ser. No. 504,992
Claims priority, application Japan, Sept. 17, 1973, 48-108574[U]
Int. Cl.² H01L 41/04
U.S. Cl. 310—9.6 4 Claims



1. A resonator comprising, a tuning fork made of a piezoelectric material having tines, each tine having partial electrodes on opposite sides thereof, electrical paths formed on the tuning fork electrically pairing the electrodes on the tines, each partial electrode having a partial length on the effective length of the corresponding tine less than the effective length of the corresponding tine, the effective length of each tine corresponding to the length of the portion thereof from the root to the outermost tip thereof, the ratio of the partial length of each electrode to the effective length of a corresponding tine being chosen at a value such that the relationship therebetween is effective to cancel in the corresponding tine the induced field due to deformation corresponding to second and higher harmonic oscillations, whereby each corresponding tine oscillates substantially only at a desired fundamental frequency.

3,946,258

GRIPPER TYPE LINEAR MOTION DEVICE

Adam Leshem, Bloomfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed July 1, 1974, Ser. No. 484,749
Int. Cl.² H02K 41/02
U.S. Cl. 310—14 8 Claims

1. Apparatus for axially moving a member comprising:

a longitudinally extending shaft connected at one end to said member to be moved, said shaft having a plurality of longitudinally spaced laterally extending projections thereon, each of said projections having an upper surface and a lower surface and the minimum axial spacing between the lower surface of each of said projections and the upper surface of the next lower axially adjacent projection being of a first predetermined distance;

a support means;

first latching means supported on said support means and being adapted to be moved into an unlatched position, a coupled position, and a latched position with respect to said projections on said shaft, said first latching means when in said unlatched position being positioned in non-engagable relationship with said projections on said shaft, when in said latched position being positioned in engagable relationship with respect to said projections and being engaged with one of said projections to bear the load of

said shaft, and when in said coupled position being positioned in engagable relationship with respect to said projectons but being positioned between adjacent projections so as not to be subject to the load of said shaft;

first moving means for moving said first latching means longitudinally relative to said support means between a lower position and an upper position, the axial distance between said lower position and said upper position of said first latching means being of a second predetermined distance;

second latching means supported on said support means and being adapted to be moved into an unlatched position, a coupled position and a latched position with respect to said projections on said shaft, said second latching means when in said unlatched position being positioned in non-engagable relationship with said projections on said shaft, when in said latched position being positioned in engagable relationship with respect to said projections and being engaged with one of said projections to bear the load of said shaft, and when in said coupled position being positioned in engagable relationship with respect to said projections but being positioned between adjacent projections so as not to be subject to the load of said shaft;

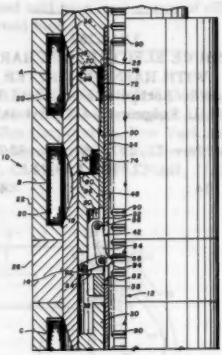
second moving means for moving said second latching means longitudinally relative to said support means between a lower position and an upper position, the axial distance between said lower position and said upper position of said second latching means being of a third predetermined distance; and

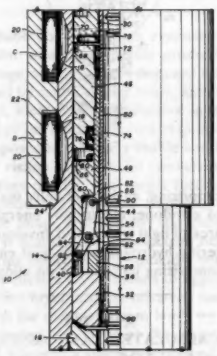
said first latching means and said second latching means being supported in spaced relationship on said support means and said predetermined distances being interrelated such that the following relationships exist:

a. when said first latching means is in a latched position with respect to said projections and is in its upper position with respect to said support means, and when said second latching means is in a coupled position with respect to said projections and in its lower position with respect to said support means, one of said projections is a fourth predetermined distance above said second latching means;

b. when said second latching means is in a latched position with respect to said projections and is in its upper position relative to said support means, and said first latching means is in a coupled position with respect to said projections and is in its lower position with respect to said support means, one of said projections is a fifth predetermined distance above said first latching means; and

c. said first predetermined distance is greater than said second predetermined distance less said fourth predetermined distance and is also greater than said third predetermined distance less said fifth predetermined distance.





3,946,259

ELECTRIC STEPPING MOTORS AND REMOTE REGISTERS

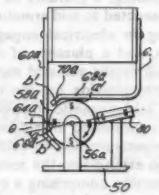
Maurice Graham McBride, Barnet, and Bernard Herbert Leslie Gray, Enfield, both of England, assignors to Sangamo Weston Limited, Enfield, England

Filed Sept. 14, 1973, Ser. No. 397,273

Claims priority, application United Kingdom, Sept. 18, 1972, 43216/72

Int. Cl.² H02K 37/00

U.S. Cl. 310—49 R **8 Claims**

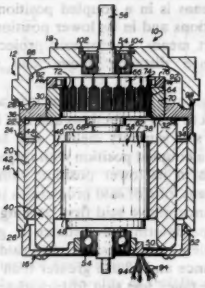


1. An electric stepping motor comprising a permanently magnetised rotor having peripheral magnetic poles, means mounting said rotor for rotation about an axis of rotation, a stationary magnetic circuit comprising a pair of stator pole members each having at least one polar surface positioned adjacent to the periphery of the rotor, an electromagnet winding associated with a part of the magnetic circuit to produce, when energised, opposite magnetic polarities in the respective stator pole members, and stationary magnetic biasing means fixedly mounted on frame means adjacent to said rotor, the magnetic flux in the magnetic circuit and through the rotor by way of the polar surfaces being sufficient as to produce and output rotary movement of said rotor through a first predetermined angle in a given direction in response to an input energizing current to said winding, and the magnetic flux due to said biasing means being sufficient as to produce a rotary movement of the rotor through a second predetermined angle in the same direction as the first-mentioned direction in response to de-energisation of said winding but being insufficient to prevent the rotation of the rotor through said first predetermined angle when said winding is energized.

3,946,260
MOTOR CONSTRUCTION

James Frezzolini, and James J. Crawford, both of Ringwood, N.J., assignors to Frezzolini Electronics, Inc., Hawthorne, N.J.

Filed Aug. 19, 1974, Ser. No. 498,463
Int. Cl.² H02K 5/04
U.S. Cl. 310—112 4 Claims



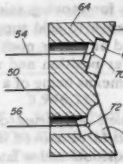
1. In combination, an AC and a separate DC motor comprising a single housing including a wide center section having respective open ends, a first end bell closing one of said open ends of said center section, a second end bell closing the other of said open ends of said center section, respective recesses in said first and second end bells, a single integral rigid shaft extending through said housing and being rotatably supported in said end bells; said AC motor comprising a rotor fixedly mounted on said shaft, and a stator in said housing surrounding said rotor and positioned to extend into the recess in said first end bell; said DC motor comprising an armature winding fixedly mounted on said shaft adjacent said rotor, magnetic poles in said center section in electromagnetic cooperation with said armature winding, a plurality of commutator segments on said shaft connected to said armature winding, brush means in said housing in electrical engagement with said commutator segments, and a plurality of leads respectively connected to said brush means and said stator and extending through said housing to provide for the connection of an energy source thereto, said magnetic poles comprising a cylindrical magnet coaxially supported in said housing, said armature winding being in juxtaposition to said rotor and being sized and positioned to extend into the recess in said second end bell, said center section comprising a cylinder having an enlarged diameter portion which receives said stator therein, and a reduced diameter portion which receives said magnetic poles therein in sliding engagement with the walls defining said reduced diameter portion, said magnetic poles being sized to extend beyond the end of said reduced diameter portion of said center section and into said recess of said second end bell.

3,946,261
DUAL FILAMENT X-RAY TUBE

William P. Holland, West Redding; Capleton I. Swanson, Bridgeport, and Jacob A. Randmer, Wilton, all of Conn., assignors to The Machlett Laboratories, Inc., Stamford, Conn.

Filed Jan. 3, 1975, Ser. No. 538,276
Int. Cl.² H01J 35/06
U.S. Cl. 313—56 8 Claims

1. An X-ray tube comprising:
an envelope
an anode having a target surface disposed within the envelope; and
cathode means operatively spaced from the target surface and including a pair of separately operable, electron emitters for directing respective electron beams onto the target surface and generating associated X-ray beams,

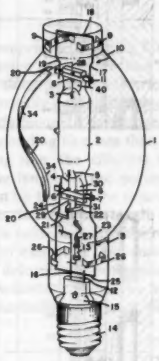


one of the emitters being made of thoriated tungsten material and the other being made of substantially pure tungsten material.

3,946,262
HIGH PRESSURE ELECTRIC DISCHARGE DEVICE WITH HAFNIUM GETTER

William M. Keeffe, Rockport, Mass., and Frederic Koury, Alexandria, N.H., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Nov. 22, 1974, Ser. No. 526,197
Int. Cl.² H01J 61/24
U.S. Cl. 313—174 20 Claims



1. A lamp comprising: an hermetically sealed envelope; an inert gas in said envelope; electrically energizable means for providing a source of light within said envelope; and means for selectively gettering hydrogen within said envelope, said gettering means comprising hafnium or an alloy thereof.

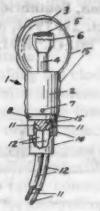
3,946,263
ENCAPSULATED LAMP ASSEMBLY

Harry W. Protzeller, 3328 Sandra Drive, Shreveport, La. 71109

Filed Dec. 23, 1974, Ser. No. 536,958
Int. Cl.² H01J 5/02, 19/54
U.S. Cl. 313—312 7 Claims

1. An encapsulated lamp for insertion in mounting brackets of vehicles comprising:
a. a base;
b. a bulb carried by said base and fitted with at least one filament;
c. at least one bus mounted on said base and in electrical cooperation with said at least one filament;
d. electrical leads fitted to said at least one bus;
e. a boot having a first portion in cooperation with said leads and having a second larger portion fitted over said at least

one bus and the portion of said leads fitted to said at least one bus;



f. a silicone composition coating over said at least one bus, said bulb, and said base, and a core of silicone composition inside said boot.

3,946,264

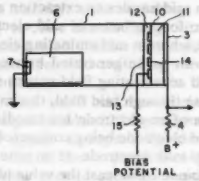
INFRA-RED RESPONSIVE CAMERA TUBE

Merton Howard Crowell, Cumberland, R.I., assignor to North American Philips Corporation, New York, N.Y.

Filed Apr. 18, 1975, Ser. No. 569,269

Int. Cl.² H01J *29/89, 39/49, 31/26*

U.S. Cl. 313—388 **3 Claims**



1. A camera tube comprising an evacuated envelope, an electron gun within said envelope for producing an electron beam, and an image sensing target disposed within said envelope to be scanned by said electron beam, said target comprising a transparent, electrically conductive layer, an optically transparent layer of infra-red radiation responsive material on said layer and disposed to receive a visible and infra-red image and transmit the visible image while converting the infra-red image into a voltage profile, said target further comprising a layer of photoconductive material disposed to receive the transmitted visible image and convert the same into a potential image which is scanned by the electron beam, a plurality of conductive strips between said optically transparent layer and said photoconductive layer, means to apply a potential to the photoconductive layer and the infra-red radiation responsive layer at which the electron beam lands on the photoconductive layer reducing the layer at the point of landing to cathode potential whereby a signal is produced corresponding to the light intensity and intensity of infra-red radiation at said landing point.

3,946,265

VIDICON WITH GRID WIRE ANGLES SELECTED TO MINIMIZE CHROMINANCE SIGNAL INTERFERENCE

Leonardus Adrianus Johannes Verhoeven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

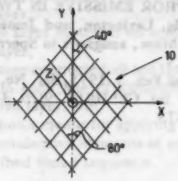
Continuation of Ser. No. 71,468, Sept. 11, 1970, abandoned.

This application Dec. 10, 1971, Ser. No. 206,948

Int. Cl.² H01J *31/28, 31/38;* **H04N** *9/04*

U.S. Cl. 313—390 **4 Claims**

1. A television camera tube of the vidicon type suitable for use for transmission of color television signals comprising an evacuated envelope, and within the envelope an electron beam source, a photosensitive target spaced from the electron beam source and positioned to receive an image of a scene, means to scan said target with said beam for generating a raster, and a conductive gauze consisting of two intersecting sets of parallel wires spaced a few millimeters from that side



of said target facing said beam source, the wires of one set intersecting those of the other set at an angle between 60° and 80°, and the wires of each set forming equal angles with the frame scan direction, whereby interference in decoded N.T.S.C. and P.A.L. chrominance signals due to the electron beam passing across the wires of the gauze is minimized.

3,946,266

ELECTROSTATIC AND DYNAMIC MAGNETIC CONTROL OF CATHODE RAY FOR DISTORTION COMPENSATION

Tsunenari Saito, Mitaka, and Yoshio Aoki, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

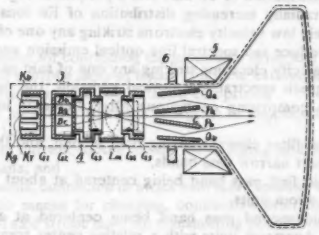
Continuation of Ser. No. 476,152, June 3, 1974, abandoned.

This application June 17, 1975, Ser. No. 587,696

Claims priority, application Japan, June 11, 1973, 48-65662

Int. Cl.² H01J *29/56, 29/51, 31/20*

U.S. Cl. 313—442 **9 Claims**



1. A cathode ray tube having an envelope provided with a phosphor screen thereon, comprising:

a. beam generating means for emitting at least one electron beam toward said screen to be deflected at a region between said beam generating means and said screen to scan said screen;

b. electrostatic beam control means located to affect said beam between said beam generating means and said region and operable on said electron beam for deforming the crosssectional shape of said electron beam to compensate for the distortion in shape of the beam landing spot on said screen at its peripheral portion casued by beam deflection; and

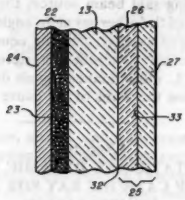
c. magnetic beam control means located to affect said beam between said beam generating means and said region and operable on said electron beam for further deforming the cross-sectional shape of said electron beam dynamically in synchronism with the beam deflection to compensate for the distortion in shape of the beam landing spot on

said screen at its central portion caused by said electrostatic beam control means.

3,946,267
PLURAL FILTER SYSTEM COOPERATING WITH CATHODE RAY DISPLAY WITH LANTHANUM HOST PHOSPHOR EMISSIVE IN TWO COLORS

Claude D. Lustig, Lexington, and James B. Thaxter, Townsend, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,644
Int. Cl.[2] H01J 29/20, 31/20
U.S. Cl. 313—473 6 Claims



1. The combination of an optical filter system and a penetration phosphor cathode ray display tube having a phosphor screen composed at least of particles of a La host phosphor each with at least a central region having a substantially uniform distribution of Tb ions and a peripheral region containing a radially increasing distribution of Eu ions such that relatively low velocity electrons striking any one of said particles produce red spectral line optical emission and relatively high velocity electrons striking any one of said particles produce green spectral line optical emission, the optical filter system comprising contiguous filter elements including at least:

a first filter element having first, second, and third spaced apart narrow pass bands,

said first pass band being centered at about 4935 Angstrom units,

said second pass band being centered at about 5525 Angstrom units with a relative center transmission of about 0.8 dropping to about 0.4 relative transmission at about 5405 and 5635 Angstrom units, and

said third pass band having about 0.42 relative transmission at about 6120 Angstrom units and exceeding 0.7 relative transmission between about 6150 and 6750 Angstrom units, the relative transmission dropping to substantially zero between said second and third pass bands, and

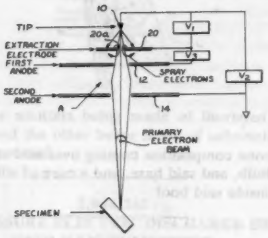
a second filter element having a relative transmission rising from substantially zero at 5000 Angstrom units through about 0.5 relative transmission at about 5185 Angstrom units and asymtotically rising to a unity transmission plateau at about 5626 Angstrom units, thereby substantially negating the effect of said first pass band,

said first and second filters cooperatively operating with respect to the natural spectral response of the normal eye to provide enhanced brightness of said red and green spectral lines in the presence of ambient illumination of the face of said penetration phosphor cathode ray tube from substantially any forward angle.

3,946,268
FIELD EMISSION GUN IMPROVEMENT

Leonard M. Welter, Saratoga, Calif., assignor to American Optical Corporation, Southbridge, Mass.

Filed Oct. 21, 1974, Ser. No. 516,323
Int. Cl.[2] H01J 29/56
U.S. Cl. 315—31 R 6 Claims

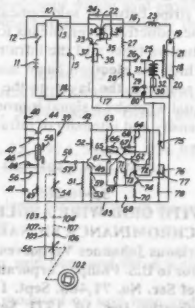


1. In a field emission electron gun for use in such as an electron microscope including a vacuum chamber having disposed therein an electron source having a tip, a first anode spaced downstream of said tip, and a second anode spaced downstream of said first anode and voltage means connected to said first and second anodes for supplying electrical potential to establish between said anodes an extraction and a focus and accelerating field to form a beam of said electrons emunating from said source, wherein said eminating electrons also cause secondary electrons to be generated between said tip and first anode and said accelerating field causes said secondary electrons to migrate through said field, the improvement comprising the addition of an electrode intermediate said tip and said first anode, said electrode being connected to voltage means for maintaining said electrode at a potential more positive than said first anode by at least the value of the lowest energy of secondary electron sought to be prevented from migrating through said acceierating field.

3,946,269
ELECTRONIC FLASH SYSTEM

Itsuki Ban, 829, Higashi, Oizumimachi, Nerima, Tokyo, Japan

Continuation of Ser. No. 256,122, May 23, 1972, abandoned.
This application Jan. 14, 1974, Ser. No. 433,382
Claims priority, application Japan, May 25, 1971, 46-35156
Int. Cl.[2] H05B 37/02
U.S. Cl. 315—151 9 Claims



1. An electronic flash system used for obtaining light energy to illuminate the object to be photographed, comprising:

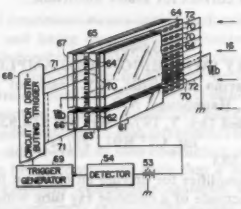
a flashtube;

an electric energy storage means for storing light energy to be applied to the flashtube;
a discharge circuit connecting the storage means to the flashtube to produce a flash of light;
a trigger circuit connected to said flashtube for actuating the emission of the flashtube;
switching means for controlling the closing and opening of the discharge circuit; monitoring means connected to said switching means for monitoring luminous intensity of reflected light from the object subjected to a flashlight, said monitoring means being adapted to produce an output signal when said luminous intensity of reflected light reaches a predetermined value; control means connected to said switching means for controlling actuation of said switching means, said control means being adapted to produce a control signal for operating said switching means to close the discharge circuit when said trigger circuit triggers the flashtube, said switching means being prevented from being actuated by said control means to maintain the discharge circuit in open condition after the passage of a predetermined time from actuation of said switching means to open the discharge circuit whenever said monitoring means provides an output signal, the intensity of reflected light incident upon the film from the object to be photographed being at a predetermined level, independent of the distance to the object, the intensity of the flash being substantially constant independent of the distance of the object, the exposure time constant being maintained to maintain a predetermined photographic density, said switching means being actuated initially to close the discharge circuit by a control signal from said control means when said trigger circuit triggers said flashtube, said switching means being actuated by said control means to maintain the discharge circuit in closed state until said monitoring means provides an output signal, said switching means being actuated by said control means to repeatedly close and open said discharge circuit for a predetermined period when said monitoring means provides said output signal, said switching means being actuated by said control means to maintain said discharge circuit in open state after lapse of said predetermined period.

3,946,270
SIGNAL COLLECTING AND DISTRIBUTING SYSTEMS

Jun-ichi Nishizawa; Ichiemon Sasaki; Katsuhiko Ishida, all of Sendai; Syoji Tauchi, Kokubunji; Takeshi Nishimura, Kodaira; Takeo Seki, Kokubunji, and Noboru Kozuma, Tokyo, all of Japan, assignors to Semiconductor Research Foundation, Sendai and Hitachi, Ltd., Tokyo, both of, Japan

Division of Ser. No. 616,385, Feb. 15, 1967, Pat. No. 3,634,849. This application Jan. 10, 1972, Ser. No. 216,532
Claims priority, application Japan, Feb. 19, 1966, 41-9987; Mar. 12, 1966, 41-15163; Mar. 25, 1966, 41-18324; Apr. 2, 1966, 41-20528; Apr. 25, 1966, 41-25890; Apr. 25, 1966, 41-25891; Apr. 25, 1966, 41-25892
Int. Cl.[2] H05B *37/00*
U.S. Cl. 315—169 TV **7 Claims**

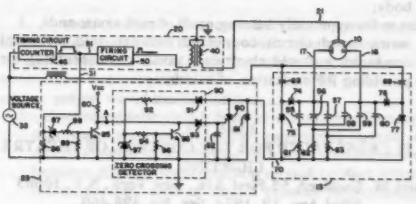


1. A transducer panel comprising
a first transparent conductive layer.
a transducer layer mounted on said first transparent conductive layer for converting one form of energy to another,
a semiconductive layer of one conductivity type having a plurality of semiconductive elements of another conductivity type embedded therein and disposed in linear spaced relation across one face thereof in contact with said transducer layer,
a second conductive layer mounted on with a face of said semiconductive layer,
a source of bias voltage connected all but the first semiconductive element in each line of elements embedded in said semiconductive layer, and
generator and distributor means for applying a trigger signal to said first semiconductive elements in each line of elements in a prescribed timed sequence.

3,946,271
SCR STROBE LAMP CONTROL FOR PREVENTING CAPACITOR RECHARGE DURING AFTER-GLOW

Gregory Stepp, and Michael Dennis Patrick, Sr., both of Urbana, Ohio, assignors to Grimes Manufacturing Company, Urbana, Ohio

Filed Dec. 26, 1974, Ser. No. 536,633
Int. Cl.[2] H05B *37/00*
U.S. Cl. 315—241 S **14 Claims**



1. In a system for controlling the successive firing and extinguishment of a strobe lamp to insure complete extinguishment of said strobe lamp, the combination comprising
capacitor means for storing a charge to be supplied to said strobe lamp;
alternating current source means for charging said capacitor means; and
circuit means, connected in series with said capacitor means and said means for charging, conductive prior to each firing of said strobe lamp for transmitting power from said means for charging to said capacitor means and nonconductive at the time of firing said strobe lamp and for a predetermined period thereafter for preventing application of power to said capacitor means from said means for charging, said predetermined period being sufficient to allow for complete extinguishment of said strobe lamp.

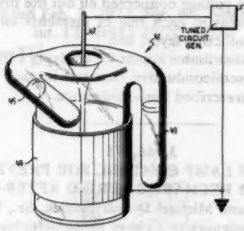
3,946,272
LOW POWER SEALED OPTICALLY THIN RESONANCE LAMP

Robert A. Young, R.R. No. 2, Loretto, Ontario, Canada

Continuation-in-part of Ser. No. 426,616, Dec. 12, 1973, Pat. No. 3,851,214. This application Oct. 7, 1974, Ser. No. 512,976
The portion of the term of this patent subsequent to Mar. 26, 1991, has been disclaimed.
Int. Cl.[2] H05B *41/24*
U.S. Cl. 315—267 **7 Claims**

1. A resonance lamp comprising
a dielectric closed body having a predetermined vacuum therein;

a reentrant coaxial hollow glass element integral within said body and extending from one end thereof substantially the length of said body;
an electrical conductor within said element;
an ultraviolet transparent window at the other end of said body;
two hollow arms integral with and extending from said body;
a high purity rare gas filling within said body at a pressure of 1 to 2 torr;



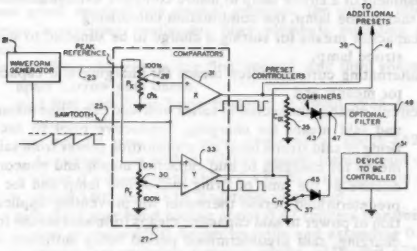
a source of diatomic gas in one of said arms;
an electrically conductive sheathing adjacent said glass body;
a getter in the other said arm for removing gases from said body;
means for separately heating each of said arms; and
a series tuned circuit connected between said electrical conductor and said electrically conductive sheathing for providing RF excitation of said lamp.

3,946,273

SPLIT CROSS FADER FOR THE CONTROL OF THEATRE LIGHTING

Robert M. Goddard, 55 First Ave., New York, N.Y. 10803

Filed Aug. 19, 1974, Ser. No. 498,460
Int. Cl.² H05B 37/02
U.S. Cl. 315—297 **24 Claims**



1. A method of developing voltage control signals to be provided to a control unit which is to be controlled in response to either of two control inputs with fading between inputs possible, comprising:

a. developing a first pulse train with pulses thereon having a duty cycle of between zero and one hundred percent which is directly proportional to a desired value of P_X corresponding to a first fader control position which may also vary between 0 and 100 percent;

b. developing a second pulse train having a duty cycle varying between zero and one hundred percent, the duty cycle being directly proportional to the desired value of P_Y corresponding to a second fader control position which also varies between zero and one hundred percent, the timing of said first and second pulse trains being such so that when the sum of the duty cycles of the pulses on said first and second pulse trains is less than one hundred percent, the pulses do not overlap in the time domain;

c. multiplying said first pulse train by a value C_{1X} corresponding to a first input preset to develop a first modulated pulse train;

d. multiplying modulating said second pulse train by a quantity C_{1Y} corresponding to a second input preset to develop a second modulated pulse train;

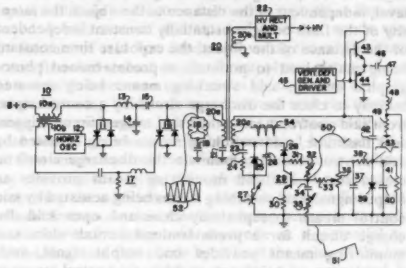
e. combining said first and second modulated pulse trains to provide an output which has a magnitude equal to the largest magnitude of either pulse train present at a given time, said output signal being the signal provided to drive said control unit.

3,946,274

SIDE PINCUSHION CORRECTION CIRCUIT

Wolfgang Friedrich Wilhelm Dietz, New Hope, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 18, 1974, Ser. No. 462,058
Int. Cl.² H01J 29/56
U.S. Cl. 315—371 **7 Claims**



1. A raster correction circuit comprising:

a line frequency generator;

a line frequency deflection winding coupled to said line frequency generator;

a line frequency output transformer coupled to said line frequency generator;

power supply means including rectifying means coupled to a winding of said line frequency output transformer for producing a direct current voltage from line rate energy in said winding;

a field frequency generator coupled to said rectifying means for obtaining operating current therefrom; and

active current conducting means coupled in circuit with said rectifying means and responsive to signals derived from said field frequency generator for providing a variable impedance path for current in said rectifying means at a field deflection rate for loading said transformer and varying line rate current in said deflection winding in a manner to correct for raster distortion.

3,946,275

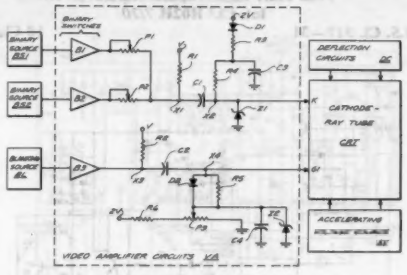
BINARY SWITCHING VIDEO AMPLIFIER

Francis C. Marino, Dix Hills, N.Y., assignor to Redactron Corporation, Hauppsuge, N.Y.

Filed Oct. 7, 1974, Ser. No. 512,533
Int. Cl.² H01J 29/52
U.S. Cl. 315—383 **12 Claims**

1. A video amplifier for driving an electron beam intensity controlling electrode of a cathode ray tube which operates at a first set of voltage levels comprising a first solid state high speed binary switch means operating at a second set of voltage levels smaller than said first set for switching between first and

second conductive states, said binary switch means having an input terminal for receiving a binary signal and an output terminal for transmitting a binary signal, a first coupling capacitor having a first terminal connected to said output terminal and a second terminal connected to the electrode of the cathode ray tube and a D.C. restoration means connected to the second terminal of said first coupling capacitor.

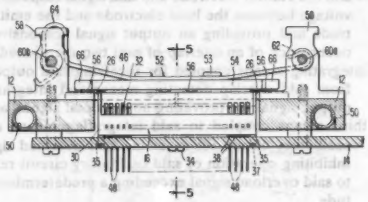


3,946,276

ISLAND ASSEMBLY EMPLOYING COOLING MEANS FOR HIGH DENSITY INTEGRATED CIRCUIT PACKAGING

Robert E. Braun, Norristown; Richard H. Jones, Wayne; George J. Sprenkle, Phoenixville, all of Pa., and Herbert Stopper, Orchard Lake, Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 9, 1974, Ser. No. 513,283
Int. Cl.² H01L *23/24*
U.S. Cl. 317—100 **11 Claims**



1. A packaging system for electronic equipment comprising at least one island, said island including

a plurality of integrated circuit packages, each package having a plurality of electrical conductors and a heat sink member with integral extensions at its opposite extremes,

connector means mounting said packages,

an interconnection medium having a plurality of conductive pads,

each of said connector means having a plurality of electrical contacts and being operatively connected in predetermined relationship to said interconnection medium and providing respective electrical paths between said integrated circuit package electrical conductors and said interconnection medium conductive pads, and

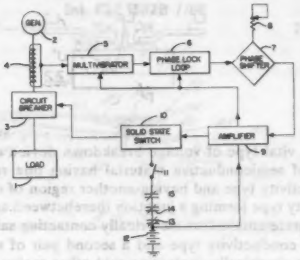
a cooling frame fastened to said interconnection medium on the same side thereof as said conductive pads, said cooling frame being configured such that a plurality of sections of thermally conductive material are situated in parallel spaced-apart relationship across the surface of said interconnection medium, each of said connector means being located in the space between an adjacent pair of said cooling frame sections, the heat sink member of each integrated circuit package mounted in said connector means straddling said means such that said integral extensions contact respectively said last mentioned pair of cooling frame sections.

3,946,277

ZERO CURRENT SWITCHING CIRCUITRY

George M. Lange, 10220 Edgewood Drive, Sun City, Ariz. 85351, and Walter C. Pierce, 5712 Chapmin Ave., Alexandria, Va. 22303

Filed Aug. 28, 1974, Ser. No. 501,399
Int. Cl.² H01H *33/59*; H02H *3/00*
U.S. Cl. 317—11 A **2 Claims**



1. A control circuit for controlled deenergization of an electromagnetic circuit breaker which interconnects an AC voltage source and a load such that said circuit breaker interconnection contacts open at a zero current point on said source output waveform comprising:

An electromagnetic circuit breaker including coil energization state responsive contact interrupter means, said circuit breaker characterized by a determined time delay between time of deenergization of said contact interruptor means and time of circuit breaker interconnection contacts opening;

sensing means for sensing the waveform of said load current;

signal processing means coupled to the output of said sensing means including means for generating a square wave signal in phase with the waveform of said load current, and means for phase shifting said square wave signal, said phase shifting means adapted to permit shifting of the phase of said square wave signal an amount directly proportional to said predetermined time delay of said contact interrupter means of said circuit breaker;

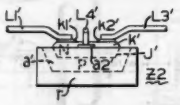
amplifier means for amplifying the output of said signal processing means, the output of said amplifier means being a square wave signal of selected amplitude;

solid state switching means having a square wave signal conductive path, said switching means including DC voltage responsive trigger means, a DC voltage source, and means for applying said DC voltage source to said trigger means, said means for applying incorporating at least one disconnect means, said switching means adapted to interrupt said signal conductive path thereof at the next zero crossing of the square wave input signal thereto subsequent to disconnect of said DC voltage source from said trigger means,

and cascade interconnection means adapted to interconnect said sensing means, said signal processing means, said amplifier means, said square wave signal conductive path of said solid state switching means and said contact interrupter means of said circuit breaker such that the output of said amplifier means energizes said contact interrupter means when said DC voltage source is connected to said trigger means of said switching means and such that energization of said contact interrupter means of said circuit breaker ceases a predetermined time in

advance of the next to occur zero current point on said source output waveform when said DC voltage is disconnected from said trigger means of said solid state switching means.

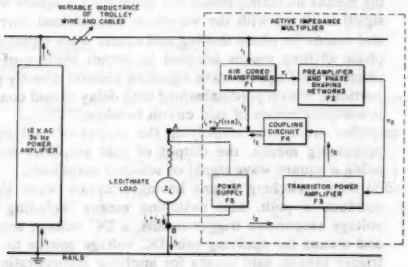
3,946,278
FAIL-SAFE FOUR LEADED ZENER DIODE ARRANGEMENT
Andrew Hufnagel, Pittsburgh, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.
Filed Dec. 19, 1973, Ser. No. 426,031
Int. Cl.² H02H 7/00
U.S. Cl. 317—16 6 Claims



1. A vital type of voltage breakdown device comprising, a body of semiconductive material having one region of one conductivity type and having another region of opposite conductivity type forming a junction therebetween and a first pair of separate conductors electrically contacting said one region of one conductivity type and a second pair of separate conductors electrically contacting said other region of the opposite conductivity type, and the junction between said one region of one conductivity type and said other region of opposite conductivity type is a multi-surface contiguous border,

---

3,946,279
ACTIVE IMPEDANCE MULTIPLIER
Derek A. Paice, Murrysville, and Alan B. Shimp, Monroeville, both of Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.
Filed Dec. 10, 1974, Ser. No. 531,404
Int. Cl.² H02H 3/16
U.S. Cl. 317—18 C 12 Claims


VARIABLE INDUCTANCE OF TROLLEY WIRE AND CABLES
ACTIVE IMPEDANCE MULTIPLIER
AIR CORED TRANSFORMER F1
PREAMPLIFIER AND PHASE SHAPING NETWORKS F2
COUPLING CIRCUIT F4
115 V AC 3φ 10 KC POWER AMPLIFIER
LEGITIMATE LOAD
POWER SUPPLY F5
TRANSISTOR POWER AMPLIFIER F3
RAILS

1. An active impedance multiplier system comprising in combination:

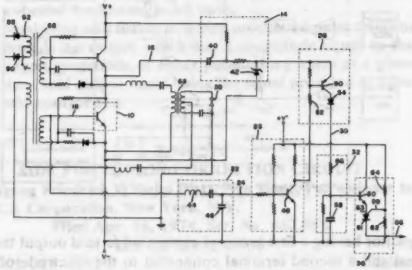
a low impedance load connected to an electric power source for the load;

means for impressing a voltage with a substantially constant frequency across said low impedance load; and

an active impedance multiplier circuit comprising a current detector with means for detecting the amount of the current from said means for impressing a voltage before it flows through said load; and

current amplification means connected to the output of said current detector to amplify the level of its current by several factors and thereafter output this amplified current to the parallel connected low impedance load.

3,946,280
OVERLOAD PROTECTION CIRCUIT
Eric G. Quist, Roxbury, Conn., assignor to Branson Ultrasonics Corporation, New Canaan, Conn.
Filed Mar. 10, 1975, Ser. No. 557,079
Int. Cl.² H02H 7/20
U.S. Cl. 317—31 10 Claims



1. An electrical circuit for providing overload protection in an oscillatory circuit having at least one switching transistor coupled to the primary winding of a transformer for driving an electro-acoustic converter coupled to a secondary winding of the transformer comprising:

first means coupled to the switching transistor for providing a signal responsive to the voltage between the collector electrode and the emitter electrode of said switching transistor;

second means coupled to said switching transistor for providing a signal with adjustable phase, responsive to the voltage between the base electrode and the emitter electrode of said switching transistor;

overlap detecting means coupled for receiving said signal responsive to the voltage between the collector electrode and the emitter electrode and said signal responsive to the voltage between the base electrode and the emitter electrode and providing an output signal responsive to the occurrence of an overlap of said two mentioned signals;

integrating means coupled for receiving said output signal from said overlap detecting means and integrating said output signal for providing an overload signal, and

third means coupled to said integrating means and said oscillatory circuit for receiving said overload signal and inhibiting operation of said oscillatory circuit responsive to said overload signal exceeding a predetermined amplitude.

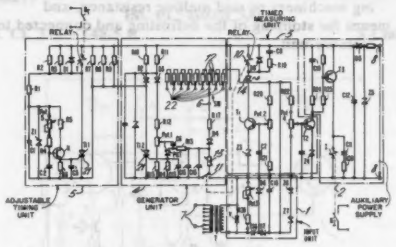
3,946,281
OVERCURRENT PROTECTION SYSTEM WITH VARIABLE INVERSE-TIME CHARACTERISTIC
Jesus Gomez Llona, and Sabino de Bernedo Melendo, both of Munguia, Spain, assignors to Arteche, Instrumentacion Y Sistemas Electronicos, S.A., Munguia, Spain
Filed May 13, 1974, Ser. No. 469,540
Claims priority, application Spain, May 11, 1973, 414664
Int. Cl.² H02H 3/08
U.S. Cl. 317—36 TD 17 Claims

1. An overcurrent protection system for protecting an electrical system, comprising:

input means (1) having an input (7) for obtaining a sample of a time-varying electrical signal from the electrical system being protected and for generating a time-varying output when the input signal to said input means (1) exceeds a given value;

generator means (3, 4) coupled to said input means (1) for selectively generating a first trip signal either immediately after receipt of the output of said input means (1) or after a first predetermined time has elapsed after receipt of the output of said input means (1), said first predetermined

time being inversely proportional to the amplitude of the output of said input means (1), said generator means (3, 4) including a variable time constant means (6, 12) operating on a signal corresponding to said output signal of said input means (1) for varying the inverse-time characteristic of said generator means;



variable timing means (5) responsive to said first trip signal generated by said generator means (3, 4) for generating a second trip signal after a second predetermined time elapses after receipt of said first trip signal, thereby shifting in time the inverse-time characteristic of said generator means; and

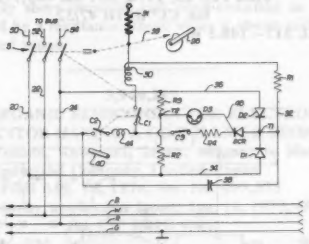
means responsive to said second trip signal for indicating that said input to said input means (1) has exceeded said given value.

3,946,282

WIRING INTEGRITY SYSTEM

Hubert Leger Weiss, Los Angeles, and Ernst Josef Dinkel, Cerritos, both of Calif., assignors to American Construction Equipment Co., Inc., Los Angeles, Calif.

Filed May 15, 1974, Ser. No. 470,181
Int. Cl.² H02H *3/14, 3/34, 7/22*
U.S. Cl. 317—48 **3 Claims**



1. In a portable or temporary electrical distribution system:

a. a distribution box;

b. a plurality of one or more service sockets accessible at the box for connection of a load;

c. a multiple circuit conductor cable for supplying electrical energy to the box;

d. a multiple master switch for placing the said one or more service sockets in conductive relationship with the multiple circuit conductor cable

e. sensing means located in the box for preventing operating of said master switch upon the existence of a transportation of wiring ahead of said sensing means; and

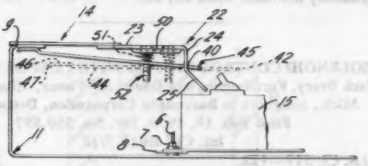
f. said cable including at least three conductors corresponding to three elements of an Edison distribution system, there being a neutral conductor and two hot conductors, the voltage between the hot conductors being normally twice the voltage between either hot conductor and the neutral conductor; said switch having 3 poles; there being service sockets cooperable with one side of the three conductor system and there being service sockets cooperable with the other side of the three conductor system; said switch once closed remaining closed notwithstanding a later existing wiring fault sensed by said sensing means whereby possibly vital equipment on the companion circuit side remains operatively connected.

3,946,283

PANELBOARD FRONT HAVING CONCEALED CLAMPS

James F. Meacham, Hazlet, and Louis R. Notte, Hillside, both of N.J., assignors to Federal Pacific Electric Company, Newark, N.J.

Filed Aug. 19, 1974, Ser. No. 498,467
Int. Cl.² H02B *1/08*
U.S. Cl. 317—120 **7 Claims**



1. A panelboard comprising a box having in-turned flanges on the front edges of the walls thereof, a sub-assembly of electrical devices in the box, and a trim unit largely covering the front of the box and having a portion defining an opening for exposing the devices in the box, a door for closing said opening and covering at least a portion of the trim unit surrounding said opening, said portion of the trim unit surrounding the opening cooperating with said electrical devices so as to block access to the interior of the panelboard when the door is open, and means for securing the trim unit to the box, characterized in that: the securing means includes elongated clamp bars at the back of the trim unit, each clamp bar having a clamping end portion said bars being slidable longitudinally between an extended position with its clamping end portion opposite one of said flanges and a withdrawn position with its clamping end portion clear of the flange and each clamp bar having a manipulating end portion directly accessable from the front of the trim unit in both said positions of the clamp bar, said securing means also having tightening means for each clamp bar including an operating means at the front of the trim unit for tightening the clamping end portion of the clamp bar against the flange, said tightening means and the trim unit jointly supporting the elongated clamp bar and defining the path for the longitudinal movement between said extended and withdrawn positions, said door in its closed position covering said tightening means and barring access to said manipulating end portion of the clamp bar.

3,946,284

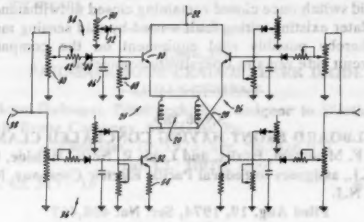
CIRCUIT FOR CONTROLLING DAMP SHOCK LOADING

Andrew M. Dieringer, Waterford, Wis., assignor to Rexnord, Inc., Milwaukee, Wis.

Filed Aug. 19, 1974, Ser. No. 498,308
Int. Cl.² H01H *47/32*
U.S. Cl. 317—123 **2 Claims**

1. A circuit for use with a hydraulic cylinder for moving a load, a proportional control valve with a coil adapted to control the flow of hydraulic fluid between a fluid source and the cylinder, a power circuit connected to the coil for providing current from a power source through the coil to ground, a transistor in the circuit on each side of the coil, a control circuit connected to the transistors for applying an input to the base of each of the transistors, and an RC circuit in the control

circuit to load and unload during the signal to increase and decrease the bias on the base of the transistor so that current



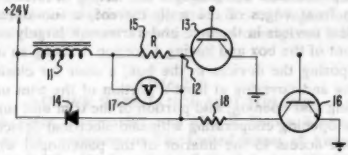
flow to the valve will gradually increase when applied and gradually decrease when cut off.

3,946,285

SOLENOID CONTROL SYSTEM WITH CUSP DETECTOR

Jack Beery, Farmington, and Daniel A. Wisner, Milan, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 18, 1975, Ser. No. 550,597
Int. Cl.² H01F 7/18
U.S. Cl. 317—123 **24 Claims**



1. A solenoid control system comprising:
a solenoid including a solenoid coil and a solenoid armature;
solenoid drive means for selectively energizing and de-energizing said solenoid coil;
means for sensing the current in said solenoid coil;
comparator means responsive to said sensing means for detecting when said solenoid armature has seated and for generating a control signal in response thereto; and
logic control means responsive to an input pulse indicative of the need for energizing said solenoid for enabling said solenoid drive means to energize said solenoid and responsive to said control signal for disabling said solenoid drive means to de-energizing said solenoid.

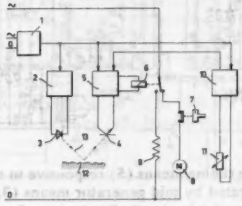
3,946,286

DEVICE FOR CONTROLLING THE FORMATION OF FROST ON COOLING RADIATORS AND THE DEFROSTING OF THE SAME

Paavo Kinnunen, Tahti, and Viljo Lukkarinen, Kouvola, both of Finland, assignors to UPO Oskeyhtio, Finland

Filed Oct. 30, 1974, Ser. No. 519,391
Claims priority, application Finland, Nov. 8, 1973, 3457/73
Int. Cl.² G01N 21/46
U.S. Cl. 317—124 **8 Claims**

1. A device for controlling the formation of frost on cooling radiators and the defrosting of the same, which device receives its operating voltage from a network component and has a relay for connecting power either to a cooling machinery or to a melting resistance, comprising
a solid state light transmitter the light of which is at least partly directed at the supposed place of frost formation,
an oscillator connected to receive its operating voltage from said network component and to feed pulses of current to said light transmitter, whereby the light thereof is in the form of light pulses,
a light receiver,
a memory unit which is controlled by said light receiver and which controls the switching of power to either said cooling machinery or said melting resistance, and
means for stopping of the defrosting and connected to said memory unit,



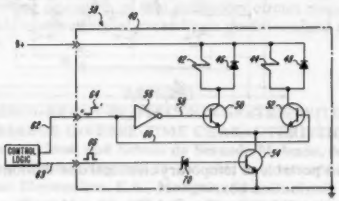
said light transmitter and said light receiver being arranged in such a way that frost formed on the cooling radiator causes a change in the quantity of light received by the light receiver from the light transmitter said change being transferred to the memory unit controlling the power which unit initiates the defrosting which goes on until said stopping means, having found that all the frost has melted, restores the memory unit to the rest position.

3,946,287

SOLENOID OPERATED FLUID VALVES

Charles L. Hopkins, Cincinnati, Ohio, assignor to The Globe Tool and Engineering Company, Dayton, Ohio

Filed Feb. 25, 1974, Ser. No. 445,772
Int. Cl.² H01H 47/32
U.S. Cl. 317—148.5 R **15 Claims**

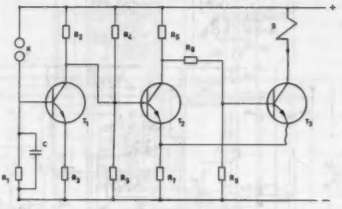


1. In a solenoid operated fluid valve for use in production machines and the like, said valve being of the type having a valve housing, a solenoid located at and fixed to said housing for controlling the operation of the valve, the improvement wherein electrical switching means operatively associated with said solenoid is fixed in relation to and located at said housing, said switching means including active means responsive to logic pulses, and external circuit connection means are provided at said housing for electrical connection of a remote solenoid operating voltage source to said solenoid and for separate electrical connection of remote control logic to said switching means.

3,946,288
SAFETY DEVICE FOR DYNAMIC UNITS

Ove Isaksson, Pitea, and Rolf Engberg, Lillpite, both of Sweden, assignors to Ove Gustav Isaksson, Pitea, Sweden

Filed June 7, 1974, Ser. No. 477,209
Claims priority, application Sweden, June 12, 1973, 7308217
Int. Cl.² H02H 5/00
U.S. Cl. 317—148.5 R 3 Claims



1. Safety apparatus for vehicles, machinery, and the like to provide a distinctive signal in the event of incapacitation or drowsiness of an operator including:

spaced electrical conductors supported on a hand-grip control means to provide thereby an open circuit which is bridged by a body portion of the operator during manual operation,

output means for providing said distinctive signal only when operated to a second distinctive condition from a first normal condition,

and circuit means connected between said conductors and said output means,

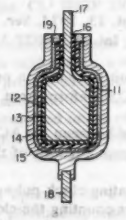
said circuit means controlling said output means to its said first normal condition only for values of resistance bridging said conductors which fall within a predetermined range,

said circuit means controlling said output means to its said second distinctive condition both when said conductors are fully short-circuited and open-circuited as well as bridged by a resistance whose value is above said predetermined range.

3,946,289
SOLID ORGANIC SEMICONDUCTOR ELECTROLYTE CAPACITOR HAVING A CO-POLYMER BINDER

Masahito Yasuda, Kawasaki, Japan, assignor to Matsushita Electric Industrial Company, Limited, Japan

Filed Aug. 14, 1974, Ser. No. 497,373
Claims priority, application Japan, Aug. 16, 1973, 48-92198
Int. Cl.² H01G 9/00
U.S. Cl. 317—230 9 Claims

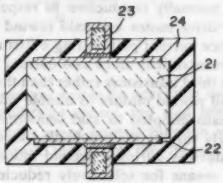


1. In a solid electrolyte capacitor having a dielectric oxide film formed on a first electrode of an anodically oxidizable metal, a second electrode and a solid electrolyte layer formed between and in intimate contact with both electrodes, the solid electrolyte consisting of a semiconductive salt of 7,7,8,8-tetracyanoquinodimethane (TCNQ) and a binder, wherein said binder is a copolymer of 60 to 80 wt % of first component and the remaining amount of second of second component, the polymer of said first component being capable of dissolving said salt of TCNQ and the polymer of said second component having strong adhering property to said dielectric oxide film.

3,946,290
HIGH TENSION CERAMIC CONDENSER

Tsunehiko Yoshioka; Yasutaka Oyamada; Shoichi Iwaya, and Minoru Sato, all of Tokyo, Japan, assignors to TDK Electronics Co. Ltd., Tokyo, Japan

Filed Aug. 9, 1974, Ser. No. 496,313
Claims priority, application Japan, Oct. 9, 1973, 48-113564; Dec. 3, 1973, 48-134265; Feb. 18, 1974, 49-18465
Int. Cl.² H01G 1/14
U.S. Cl. 317—258 10 Claims



1. A high tension ceramic condenser comprising:

a ceramic dielectric having two parallel surfaces;

an electrode layer formed on each of said parallel surfaces of said ceramic dielectric;

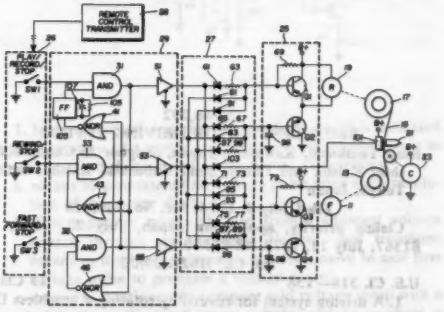
a terminal separate from the electrode layer having an expansion coefficient which is substantially the same as the expansion coefficient of said ceramic dielectric, said terminal being joined by solder or an electroconductive adhesive to at least one of said electrode layers; and,

a synthetic resin covering at least part of said electrode layers.

3,946,291
THREE MOTOR TAPE DRIVE MECHANISM

Edward A. Marbeine, Brookfield, Wis., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 4, 1974, Ser. No. 520,400
Int. Cl.² H02P 7/74
U.S. Cl. 318—7 10 Claims



1. In a tape transport mechanism operable in any of several operational modes and having a d.c. forward drive motor coupled between a source of d.c. operating potential and a reference potential for driving an associated take-up reel to

transport a tape coupled thereto in an arbitrarily designated forward direction and further having a d.c. rewind motor coupled between said d.c. source and said reference potential for driving an associated rewind reel to transport said tape in the opposite direction and rewind said tape onto said rewind reel, apparatus comprising:

motor control means for selectively varying the current through said forward drive motor and said rewind motor to correspondingly vary the respective torques developed by said motors and applied to said reels,

said motor control means including a first semiconductor device shunting said forward drive motor and a second semiconductor device interposed in series with the parallel combination of said first semiconductor device and said forward drive motor between said d.c. source and said reference potential and further including a third semiconductor device shunting said rewind motor and a fourth semiconductor device interposed in series with the parallel combination of said third semiconductor device and said rewind motor between said d.c. source and said reference potential, said first and third semiconductor devices normally conductive to respectively shunt said forward drive motor and said rewind motor with a low impedance current path during a first mode of operation so that substantially all of said current flows through said first and third transistors rather than through said forward drive and rewind motors to disable said motors; and

switch means coupled to said semiconductor devices for selectively varying the conduction level of said semiconductor devices during a second mode of operation, including means for selectively reducing the conduction level of said first and third semiconductor devices so as to enable said current to flow through said motors and means for simultaneously selectively varying the impedance of said second and fourth semiconductor devices to correspondingly vary the respective currents through said motors so that one of said motors is more fully conducting than the other of said motors,

said motor which is more fully conducting being dominant over said other motor to transport said tape in the direction determined by said dominant motor and said other motor opposing the direction of travel of said tape to properly tension said tape between said take-up reel and said rewind reel and braking a respective one of said reels whenever said mechanism is switched from the second operational mode to the first operational mode.

3,946,292

BRUSHLESS MOTOR DRIVING SYSTEM

Kinji Tanikoshi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha and Canon Seiki Kabushiki Kaisha, both of Tokyo, Japan

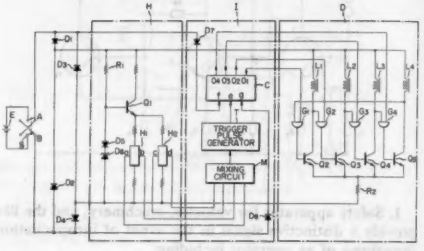
Filed July 8, 1974, Ser. No. 486,316

Claims priority, application Japan, July 20, 1973, 48-81367; July 11, 1973, 48-82500[U]

Int. Cl.² H02K *29/00*

U.S. Cl. 318—138 **15 Claims**

1. A driving system for reversibly rotating a brushless D.C. motor comprising, in combination: a rotor, polarity changing voltage source means adapted to rotate reversely said rotor, a plurality of windings positioned in torque-producing relation to said rotor, rotational position detecting means having a plurality of output terminals associated with said rotor in such relation as to detect rotational position of said rotor, a plurality of driving circuits adapted to arrange said plurality of windings and a plurality of output terminals of said rotational position detecting means in corresponding relation, said circuits being capable of applying the exciting current to said windings in response to the output of said rotational position detecting means, and automatic inversion-control means



adapted to automatically reverse the rotational direction of said rotor, said means connected to said voltage source means and operable for automatically switching the operation order of said driving circuits in response to change in polarities of said voltage source means thereby to change the energizing order of current applied to said windings, whereby the rotor may be reversed.

3,946,293

THYRISTOR CONTROL SYSTEM

Arnold W. Feld, Mendota, Ill., assignor to Conco Inc., Mendota, Ill.

Filed Sept. 13, 1974, Ser. No. 505,744

Int. Cl.² H02P *5/40*

U.S. Cl. 318—227 **18 Claims**

1. A control circuit for gating a predetermined portion of each cycle of an AC waveform from an AC source to a load, comprising:

a thyristor coupled between the AC source and the load and triggerable to pass portions of the AC waveform to the load;

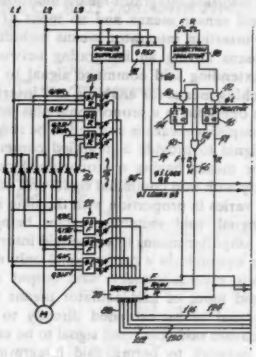
a clock for generating clock pulses;

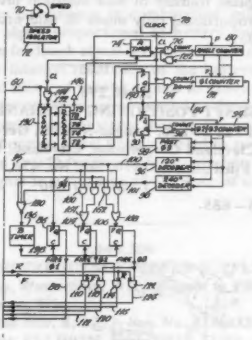
counter means for counting the clock pulses until reaching an angle count representing a firing phase angle which forms the start of the predetermined portion of the AC waveform;

synchronizing means coupled to the AC source for effectively synchronizing the count of the counter means with

a reference phase angle of the AC waveform; and

trigger means coupled to the counter means for triggering





the thyristor in response to the occurrence of the angle count.

3,946,294

PHOTOCOMPOSER MOTOR SPEED CONTROL

Frank L. Scholten, Katonah, N.Y., assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed July 3, 1974, Ser. No. 485,342
Int. Cl.² H02P 5/00
U.S. Cl. 318—313 **3 Claims**

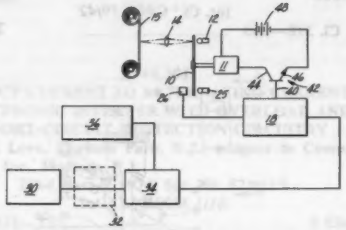
1. In a photocomposition machine having a rotatable matrix, a drive motor for said matrix, a size variable projection system to select and project a character from said font in a predetermined point size, and a photosensitive medium positioned to record the projected image of said selected font, the improvement of rotation speed control for said matrix motor coordinated to the point size selected for a character, comprising:

a controller means operable by a program for providing control data for photocomposition control of the machine;

a master clock providing a precision output pulse frequency;

a programmable frequency modifying means supplied by the frequency output of said clock and having an output from said modifying means which is a function of said control data according to a controller supplied number which is changeable at any stage of composition;

a sensor means for producing pulses representative of the speed of said matrix; and



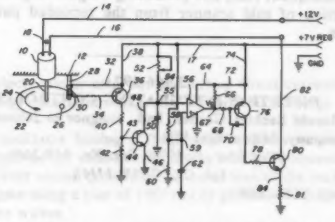
a motor speed control means for accepting output from said frequency modifying means and said sensor means to produce a motor speed control function which is phase locked with said output of the frequency modifying means.

3,946,295

SONAR FLASHER SPEED CONTROL

John C. Moore, Tulsa, Okla., assignor to Lowrance Electronics, Inc., Tulsa, Okla.

Filed Oct. 29, 1974, Ser. No. 518,581
Int. Cl.² H02P 7/00
U.S. Cl. 318—317 **3 Claims**



1. In a sonar depth indicator in which the depth is indicated by the rotation of a motor and a flasher, the improvement in means to control the speed of the motor, comprising:

a. means to generate a first voltage pulse once each revolution of the motor shaft;

b. first capacitor means charged from a constant voltage source through an adjustable resistor, and transistor means to discharge said capacitor responsive to said first voltage pulse to generate a voltage ramp;

c. means to continuously compare said voltage ramp with a selected constant reference voltage and to produce a second voltage pulse whenever said ramp voltage is greater than said reference voltage; and

d. means responsive to said second voltage pulse to provide increased drive current to said motor.

3,946,296

METHOD AND APPARATUS FOR CHECKING AND MONITORING THE ACCURACY OF THE MOVEMENT OF THE CARRIAGE OF A MACHINE TOOL RESPONSIVE TO A PREDETERMINED OPERATING PROGRAM

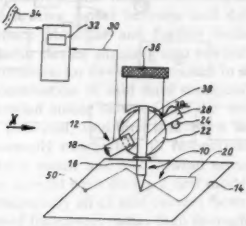
Heinrich Lahm, Esslingen-Sirnau, Germany, assignor to Index-Werke KG Hahn & Tessky, Esslingen, Germany

Filed Mar. 5, 1974, Ser. No. 448,269

Claims priority, application Germany, Mar. 8, 1973, 2311368

Int. Cl.² G05B 19/42

U.S. Cl. 318—563 **26 Claims**



1. The method of checking and monitoring the path of movement of a movable member of a numerically controlled machine tool comprising the steps of providing a system in which a track may be selectively recorded on a surface, by an instrument conjointly movable with each movement of said movable member and a system in which said recorded track may be followed by a scanner conjointly movable with the subsequent movement of said movable member, operating said machine, according to said control program, recording as a series of tracks independent of said controlled program the entire path of movement of the initial run of the said movable member according to the control program, thereafter repeating the operation of said tool in response to the control program in successive runs and causing the scanner to conjointly follow the recorded path of said tracks in each succesive run, and to sense the recorded path of said tracks during each of the subsequent runs, and producing a signal responsive to the departure of said scanner from the recorded path of said tracks.

3,946,297

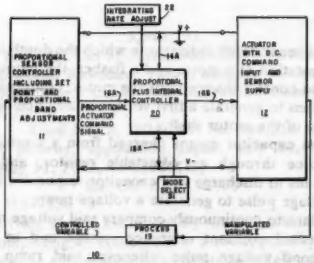
INSERTION INTEGRATING CONTROLLER

Jon Harold Bechtel, Goshen, Ind., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Mar. 5, 1974, Ser. No. 448,366

Int. Cl.² G05B 11/42

U.S. Cl. 318—609 **14 Claims**



1. In a process control system, having a proportional control loop including sensor means for monitoring a controlled variable and for providing a linearly changing command signal indicating deviations of the controlled variable from a system set point, and actuator means responsive to the command signal to control a manipulated variable to effect a change in the controlled variable to return the controlled variable to the set point, an insertion integrator means interposed between an output of said sensor means and an input of said actuator means, said insertion integrator means including integrating amplifier means having an integrating network, and input means for extending said command signal to said amplifier means, switching means for enabling said insertion integrator means to be operable in a proportional plus integral mode in which said amplifier means is enabled to be responsive to said command signal to provide a modified command signal for said actuator means having a proportional component that varies linearly with said command signal and an integral component that varies in proportion with the time integral of said command signal, said switching means being operable to disable said amplifier means to cause said insertion integrator means to be operable in a proportional only mode in which said switching means connects said output of said sensor means to said input of said actuator means to permit said command signal to be extended directly to said actuator means and causes said command signal to be extended to said integrating network to permit said integrating network to follow said command signal while said insertion integrator means is operable in said proportional only mode to thereby permit bumpless transfer of said insertion integrator means from said proportional only mode to said proportional plus integral mode.

3,946,298

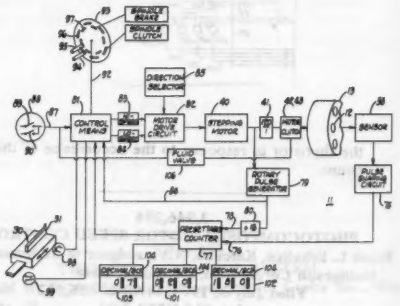
SHAFT POSITIONING MECHANISM

Hansjuergen van de Loo, Langen-Neurott, Germany, assignor to Acme-Cleveland Corporation, Cleveland, Ohio

Filed June 6, 1974, Ser. No. 476,914

Int. Cl.² G05B 19/40

U.S. Cl. 318—685 **24 Claims**



1. A rotatable shaft positioning mechanism, comprising in combination,

sensor means,

activator means cooperable with said sensor means, means to relatively rotate said sensor means and said activator means in accordance with rotation of the shaft to establish a reference signal output of said sensor means,

a motor,

means to connect said motor to rotate the shaft,

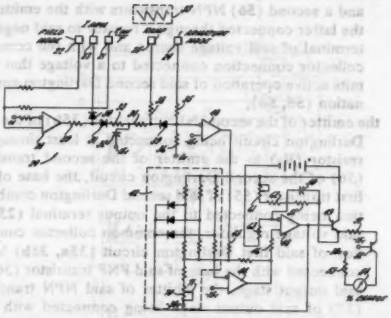
means generating a pulse for each minor fraction of a revolution of the shaft,

and means to control the shaft in accordance with the said reference signal output and with the pulses from said generator means.

3,946,299
BATTERY STATE OF CHARGE GAUGE

Clinton C. Christianson, Minnetonka, Minn., and Robert F. Bourke, Wilson, Wis., assignors to Gould, Inc., Rolling Meadows, Ill.

Filed Feb. 11, 1975, Ser. No. 548,913
Int. Cl.² H02J 7/00; G01N 27/42
U.S. Cl. 320—43 13 Claims

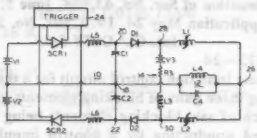


1. Circuitry for measuring the usable energy present in an electric battery comprising, in combination, means for producing a first signal proportional to battery current, means responsive to a feedback signal for generating a second signal simulating the internal resistance of the battery, means for muliplying said first and second signals to produce a product signal, means for adding a signal related to the battery terminal voltage to said product signal thereby to produce an output signal, said output signal being coupled to said generating means to serve as said feedback signal, whereby the level of said output signal is a measure of the state of charge of the battery.

3,946,300
HIGH FREQUENCY POWER SUPPLY

James P. Landis, Wauwatosa, Wis., assignor to Pillar Corporation, Milwaukee, Wis.

Filed Nov. 8, 1973, Ser. No. 413,833
Int. Cl.² H02M 7/44; H01F 37/02
U.S. Cl. 321—8 C 12 Claims



1. A circuit means for supplying high frequency power to a load and including energy storage means,

energy source means for charging the energy storage means,

first switching circuit means for periodically connecting the energy source means to the energy storage means at a frequency related to the said high frequency,

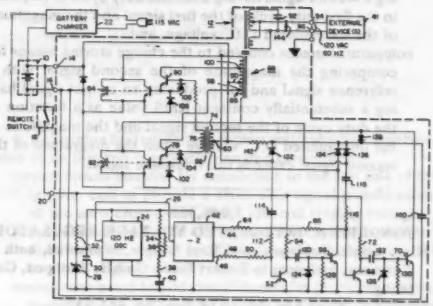
discharge means for discharging the energy storage means into the load, said discharge means including saturable reactor means,

said saturable reactor means including an elongate hollow conductor and at least one substantially annular core means mounted on said conductor and in heat exchange contact therewith and composed of a strip of magnetic material having a relatively high permeability and wound directly on said conductor, said conductor being constructed and arranged for receiving a cooling fluid therein.

3,946,301
DIRECT CURRENT TO ALTERNATING CURRENT ELECTRONIC INVERTER WITH OVERLOAD AND SHORT-CIRCUIT PROTECTION CIRCUITRY

Roger R. Love, Florham Park, N.J., assignor to Computer Power, Inc., Madison, N.J.

Filed Nov. 6, 1974, Ser. No. 521,515
Int. Cl.² H02M 1/18
U.S. Cl. 321—11 5 Claims



1. An electronic inverter for converting direct current electrical energy into alternating current electrical energy comprising:

A. an oscillator having a frequency equal to an integral multiple of the desired alternating current frequency;

B. a divider circuit connected to the output of the oscillator for generating a pair of 180° out of phase 50% duty cycle square waves;

C. a push-pull amplifier connected to the 180° out of phase square wave outputs of the divider circuit for amplifying these outputs into a high-current square wave said push-pull amplifier incorporating:

1. two sets of bi-directional current flow electronic power switches; and

2. overload protection means connected to said switches for terminating driving energy to the power switches when said power switches are in an out of saturation condition;

D. a ferro-resonant transformer connected to the high-current square wave output of the push-pull amplifier for generating a substantially sinusoidal electrical output; and

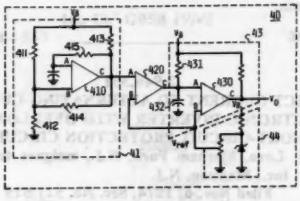
E. means for terminating the driving energy to the electronic power switches when the outputs from the divider circuit are not oscillating.

3,946,302

POWER REGULATOR WITH R.M.S. OUTPUT VOLTAGE AS FUNCTION OF UNREGULATED D.C.

Albert W. Kovalick, Santa Clara, and Kenneth D. Scholz, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 4, 1975, Ser. No. 565,309
Int. Cl.² G05F 5/00
U.S. Cl. 323—19 6 Claims



1. A power regulator energized by unregulated D.C. voltage comprising:

an oscillator for producing a first signal having a first duty cycle;

charge storing means coupled to the oscillator for producing a second signal having a second duty cycle in response to the first duty cycle of the first signal and the magnitude of the unregulated D.C. voltage; and

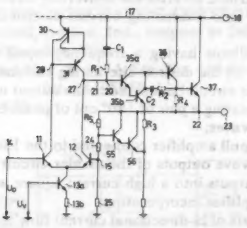
comparator means coupled to the charge storing means for comparing the magnitude of the second signal with a reference signal and for producing an output signal having a substantially constant RMS value as a function of the duty cycle of the second signal and the magnitude of the unregulated D.C. voltage when the magnitude of the second signal exceeds the reference signal.

3,946,303

MONOLITHIC INTEGRATED VOLTAGE REGULATOR

Klaus Streit, Tubingen, and Karl Staiger, Wannweil, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Apr. 18, 1974, Ser. No. 461,932
Claims priority, application Germany, Apr. 28, 1973, 2321662
Int. Cl.² G05F 1/56
U.S. Cl. 323—22 T 16 Claims



16. A monolithic integrated voltage regulator for regulating the voltage at which current is supplied from a voltage source (U_E) having positive and negative terminals comprising:

a differential amplifier having a first input (14) for connection to a reference voltage source (U_s) and having a current mirror circuit (16) coupling its outputs,

current amplifier means (19) in the form of a current amplifier with inflowing current having its input (20) connected by a conductor (21) to the noninverting output (27) of said differential amplifier, said current amplifier means having a voltage divider composed of ohmic resistances (24, 25) connected across its output, with the tap thereof connected to the second input (15) of said differential amplifier (11, 12), said current amplifier means further comprising:

an input stage consisting of a first Darlington circuit combination of two NPN transistors (35a,35b);

an output stage comprising a Lin circuit combination of a PNP transistor (36) and an NPN transistor (37), and

a second Darlington circuit combination of a first (55) and a second (56) NPN transistors with the emitter of the latter connected through a resistor to said negative terminal of said voltage source and with the common collector connection connected to a voltage that permits active operation of said second Darlington combination (55, 56),

the emitter of the second NPN transistor (35b) of the first Darlington circuit being connected at least through a resistor (R_3) to the emitter of the second transistor (56) of the second Darlington circuit, the base of the first transistor (55) of said second Darlington combination being connected to the output terminal (23) of said voltage regulator, the common collector connection of said first Darlington circuit (35a, 35b) being connected with the base of said PNP transistor (36) of said output stage, the emitter of said NPN transistor (37) of said output stage being connected with said output terminal (23) of said voltage regulator and the emitter of said PNP transistor (36) as well as the collector of said NPN transistor (37) of said output stage being connected with said positive terminal (18) of said voltage source, and

a circuit stabilizing capacitor (C_1) monolithically integrated into the circuit connected between the said conductor (21) connecting the input of said current amplifier to the noninverting output of said differential amplifier and one of said terminals of said voltage source,

the stabilized output voltage (U_a) of the voltage regulator (10) being available at said output terminal (23) to which the emitter of said NPN transistor (37) of said output stage is connected.

3,946,304

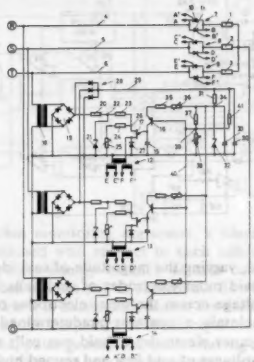
PHASE-INITIATION CONTROL ARRANGEMENT, PARTICULARLY FOR A THREE-PHASECONSUMER UNIT

Flemming Thorsoe, Augustenborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 43,908, June 5, 1970. This application May 24, 1972, Ser. No. 256,619
Int. Cl.² G05F 5/00
U.S. Cl. 323—24 4 Claims

1. A phase initiation control circuit for a three phase system comprising three pairs of blocking elements, one pair for each phase, each of said blocking elements being of a type which is rendered conducting by a control impulse and remains conducting until the end of the half-cycle; means for deriving a substantially constant direct current voltage from the three phase input to said system; means for deriving three pulsating direct current voltages from said three phase input to said system, said pulsating voltages being respectively synchronized with the three phases of said input; and, for each phase, a capacitor, charging means, first discharging means, second discharging means, an impulse transformer having a primary winding and two secondary windings, a voltage divider which is connected betweenn said substantially constant direct current voltage and the pulsating direct current voltage corresponding to said phase, and a tapping on said voltage divider, the charging means being such as to continuously charge said capacitor from said substantially constant direct current voltage, the first discharging means being such as to discharge the capacitor upon a predetermined voltage across the capacitor being reached, discharge of the capacitor by the first discharging means producing a voltage across said primary winding,

said secondary windings being directly connected to the respective blocking elements of the associated pair of blocking elements for said phase, said voltage across said primary winding causing voltage control impulses in said secondary windings to cause said blocking elements to conduct, and said second discharging means comprising a junction transistor having emitter, collector and base electrodes, the emitter-collector path of said transistor being connected across said



capacitor, said base of said transistor being connected to said tapping on said voltage divider, said substantially constant direct current voltage and said corresponding pulsating direct current voltage having a common reference potential point to which point said emitter of said transistor is connected whereby the emitter collector path of said transistor is rendered conducting when said voltage of said phase passes through zero, so completely discharging said capacitor.

3,946,305

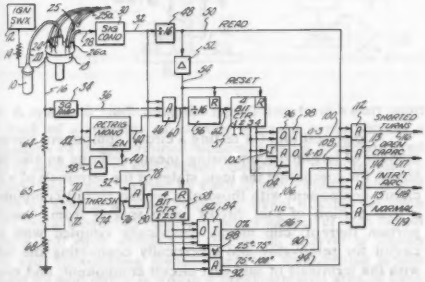
IGNITION COIL AND CAPACITOR ANALYZER UTILIZING THE ZERO CROSS-OVERS AND PEAK VOLTAGE OF THE LOW COIL RINGING VOLTAGE

Larkin M. Hasbrouck, Norfolk, and Anthony J. Fastaia, Tolland, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1974, Ser. No. 534,337

Int. Cl.² G01M *15/00*

U.S. Cl. 324—16 R **5 Claims**



1. Apparatus for testing the ignition coil/capacitor combination of an internal combustion engine comprising:

means adapted for connection to the low side of an ignition coil for providing a count signal manifestation of the number of zero cross-overs in the low coil ringing voltage;

means adapted for connection to the low side of the ignition coil for providing a threshold signal manifestation of the peak voltage of the low coil ringing voltage being above or below a given threshold voltage; and

processor means responsive to said cross-over count signal manifestation and to said threshold signal manifestation for providing condition signal manifestations of normal or abnormal conditions extant in said ignition coil/capacitor combination.

3,946,306

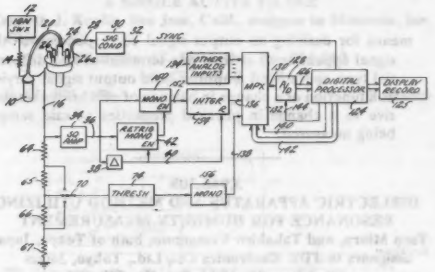
IGNITION COIL AND CAPACITOR ANALYZER UTILIZING THE ZERO CROSS OVERS AND PEAK VOLTAGE OF THE LOW COIL RINGING VOLTAGE

Larkin M. Hasbrouck, Norfolk, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1974, Ser. No. 534,524

Int. Cl.² G01M *15/00*

U.S. Cl. 324—16 R **8 Claims**



1. Apparatus for testing the ignition coil/capacitor combination of an internal combustion engine comprising:

circuit means adapted for connection to the low side of the ignition coil to provide a cross-over signal manifestation of the zero cross-overs of the low coil ringing voltage;

means connected to said circuit means for providing a signal manifestation of the number of zero cross-overs in the low coil ringing voltage; and

means connected to said circuit means for providing a signal manifestation of the peak voltage of the low coil ringing voltage being above or below a given threshold voltage.

3,946,307

APPARATUS FOR DETECTING THE PHYSICAL PROPERTIES OF MAGNETIC OR ELECTRIC CONDUCTIVE HEAT-RESPONSIVE OR DEFORMABLE MATERIAL USING NEGATIVE INPUT IMPEDANCE NETWORK

Toshiro Mori, Yokohama, and Seigo Ando, Kawasaki, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1974, Ser. No. 463,254

Claims priority, application Japan, Apr. 25, 1973, 48-46950; June 30, 1973, 48-74156; Aug. 31, 1973, 48-97873

Int. Cl.² G01R *33/12*

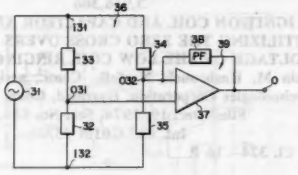
U.S. Cl. 324—34 R **18 Claims**

1. A measuring apparatus for measuring physical properties of a sample, comprising:

a pair of terminals supplying an input reference voltage of a predetermined value;

a bridge circuit whose input terminals are connected to said pair of terminals, said bridge circuit comprising: a variable impedance element disposed adjacent a sample of magnetic or electric conductive, heat-responsive or deformable material and having an impedance which varies with the physical properties of the sample being measured; and at least three other impedance elements coupled with said variable impedance element in a bridge arrangement;

a negative impedance network including: a differential type operational amplifier having a negative value of input impedance and having its input terminals coupled to the output terminals of said bridge circuit; and at least one positive feedback impedance network coupled between the input and output terminals of said differential type operational amplifier; and



means for deriving an output signal corresponding to the signal appearing at at least one terminal of said differential type operational amplifier, said output signal varying as a function of a change in balance of said bridge responsive to a change in physical properties of said sample being measured.

3,946,308

DIELECTRIC APPARATUS AND METHOD UTILIZING RESONANCE FOR HUMIDITY MEASUREMENT

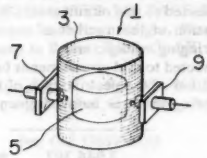
Taro Miura, and Takahiro Yamamoto, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1974, Ser. No. 527,072

Claims priority, application Japan, Nov. 27, 1973, 48-132138

Int. Cl.² G01R *27/26, 27/04;* G01W *1/00*

U.S. Cl. 324—58.5 C **9 Claims**



1. Apparatus for measuring humidity comprising a dielectric material, a shield against electrical radiant energy surrounding said dielectric material, said shield being in the form of a cylindrical sleeve comprising a wire net, and input and output antenna means positioned inside said shield and spaced from said dielectric material.

3,946,309

CELL FOR MEASURING ELECTRICAL RESISTIVITY OF A LIQUID

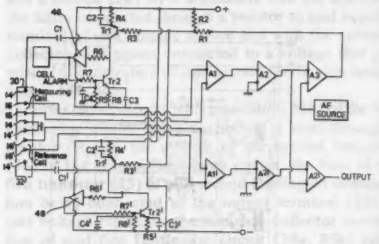
Charles Lyn Roughton, 12 Cedar Grove, Hinderton Road, Neston, Wirral, and Christopher Ian Arthur Ellis, 30 Hill Road, Birkenhead, Cheshire, both of England

Continuation of Ser. No. 277,608, Aug. 3, 1972, abandoned. This application Aug. 22, 1974, Ser. No. 499,598

Int. Cl.² G01R *27/14;* G01N *27/42*

U.S. Cl. 324—64 **6 Claims**

1. A method of comparing the electrical conductivity of two liquid samples propense to fouling electrodes in contact therewith, said method comprising the steps of introducing the sample to be tested into one cell and the sample to be used as a reference into another cell, each cell including four linearly aligned electrodes; applying an identical current to the outer electrodes of each of the cells; directly connecting the input of a first high input impedance amplifier to the inner electrodes of said four linearly aligned electrodes in said one cell, and the input of a second high input impedance amplifier to the inner electrodes of said four linearly aligned electrodes in said other cell, said amplifiers having an input impedance sufficiently high as to render the potential drops across said inner electrodes essentially independent of any fouling thereof



by the liquid; varying the magnitude of said identical current applied to said outer electrodes of said cells in dependence upon the voltage across the inner electrodes of said one cell so as to maintain a constant predetermined voltage drop across said inner electrodes of said one cell; and comparing the output voltages of said first and second high input impedance amplifiers to provide a signal indicative of the difference in conductivity between the two liquid samples.

3,946,310

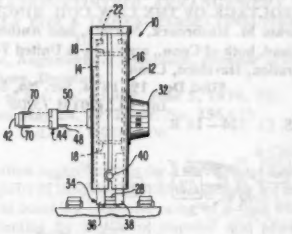
LOGIC TEST UNIT

Barry M. Saper, Los Altos, and Tim Yee Lam, Sunnyvale, both of Calif., assignors to Fluke Trendar Corporation, Mountain View, Calif.

Filed Oct. 3, 1974, Ser. No. 511,548

Int. Cl.² G01R *15/12*

U.S. Cl. 324—72.5 **12 Claims**



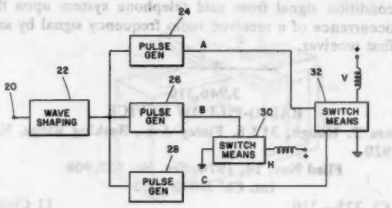
1. A logic test unit for testing a circuit component having a number of terminals comprising: means defining an electrical circuit for comparing the logic states of the terminals of a first circuit component with those of a second circuit component, a first portion of said circuit being spaced from a second portion thereof; clip means electrically coupled with said circuit for removably and electrically connecting the latter with the terminals of said first circuit component; and means removably connectable with said circuit for electrically connecting the same to said second circuit component, whereby said logic states of corresponding terminals of said circuit components can be compared with each other, said connecting means having a number of electrical pins, at least one of the pins being electrically engageable only with said first circuit portion, the remaining pins being electrically engageable with said second circuit portion.

3,946,311

AIR CORE GAUGE WITH EXPANDED POINTER RANGE

John D. Baker, Lisle, and Bryce W. Carus, Grayslake, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 368,502, June 11, 1973, abandoned. This application Apr. 29, 1974, Ser. No. 465,324
Int. Cl.² G01P 3/48; G01R 7/00
U.S. Cl. 324—167 31 Claims



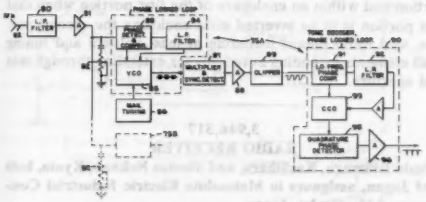
1. In condition monitoring apparatus, a plurality of coils angularly positioned with respect to each other, means for supplying electrical energy to each of said coils, switching means connected to each coil to control the flow of current in the coil to which it is connected, means for receiving repetitive input pulses, the frequency of which represent a condition to be monitored, pulse generation means having a plurality of outputs connected to said pulse receiving means for producing different control pulses on each of said outputs in response to the receipt of a single input pulse and means connecting each of said switching means to a separate one of said outputs to enable said switching means in response to a control pulse to cause a current flow in the coil to which it is connected so as to produce a resultant magnetic field.

3,946,312

TIMING APPARATUS AND SYSTEM

Robert A. Oswald, and Charles R. Kilet, both of P.O. Box 458, Highway 395 South, Gardnerville, Nev. 89410

Filed June 25, 1974, Ser. No. 483,080
Int. Cl.² G04F 8/00
U.S. Cl. 324—181 13 Claims



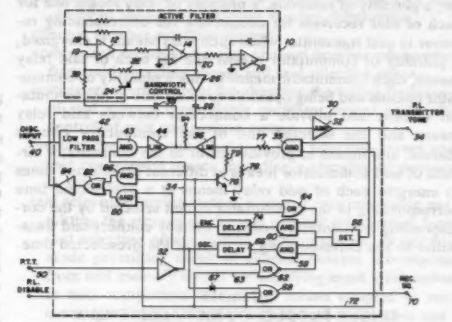
1. A system for indicating the lapsed time from a start point for each of a plurality of entities to reach a plurality of a succession of predetermined stations along a predetermined path of movement of said entities comprising: radio frequency transmitting means carried by each of said entities, each said means emanating a radio frequency signal discreet for each entity, radio frequency receiving means located at each of said stations and each adapted to receive an interval of signals from said transmitting means when the transmitting means carried by said entity is within a predetermined area of each said station, a plurality of detector means connected to said receiving means, each said detector means being adapted to discriminate and detect signals of a selected one of said discreet radio frequency signals, activating means associated with each of said detector means constructed and arranged to generate an output signal when an interval of signals from the corresponding discreet radio frequency signal is received thereby, a plurality of timing counters serially connected to each of said detector means, clock means operable to operate all said timing counters in timing unison, start means connecting said clock means to said timing counters to start said timing counter means at the same time, a timing counter stopping means for each said timing counter operable by said output signal to cause the said timing counters to discontinue counting upon being actively energized thereby, and sequencing means connected to sequence the active energization by said output signal sequentially to one of the timing counters each time an interval of output signals is received by said receiving means, whereby one of each of said series of counters will stop to indicate lapsed time from said start upon an interval of signals of the discreet radio frequency signal being received at each of the succession of predetermined stations.

3,946,313

COMBINED ENCODER-DECODER APPARATUS HAVING A SINGLE ACTIVE FILTER

Kenneth J. Krolik, San Jose, Calif., assignor to Motorola, Inc, Chicago, Ill.

Filed Oct. 15, 1974, Ser. No. 514,863
Int. Cl.² H04B 1/40
U.S. Cl. 325—18 9 Claims



1. Combined encoder-decoder apparatus for use in two-way radio equipment having a transmitter and receiver and operable in an encoder mode for providing tone oscillations during operation of the radio transmitter, and in a decoder mode for providing a control signal in response to a received tone signal of a particular frequency during operation of the radio receiver, such apparatus including in combination:

active filter means with an input, output, and a control terminal responsive to an applied potential to increase the bandwidth of said active filter means;

feedback means interconnecting said input and said output of said active filter means for producing tone oscillations;

input means coupled to said active filter input for applying received tone signals thereto; and

control circuit means coupled to said active filter means and responsive to the operation of the radio transmitter for enabling said feedback means to operate said apparatus in encoder mode and produce tone oscillations, and further responsive to the operation of the radio receiver for enabling said input means to pass tone signals and operate said apparatus in decoder mode and produce a control signal,

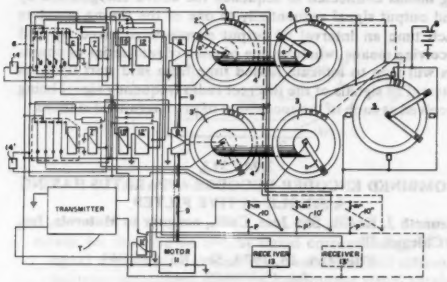
said control means further applying a predetermined potential to said active filter control terminal during transition of the radio equipment between said different modes to momentarily increase the bandwidth of said active filter means whereby stored energy present therein may be rapidly dissipated.

3,946,314

REMOTE CONTROL PROGRAMMING SYSTEM

Jose Juan Garcia, Madrid, Spain, assignor to Industrias Rumbo, S.A., Madrid, Spain

Filed Dec. 19, 1973, Ser. No. 426,126
Claims priority, application Spain, Dec. 19, 1972, 409800
Int. Cl.² H04B 1/00
U.S. Cl. 325—51 7 Claims



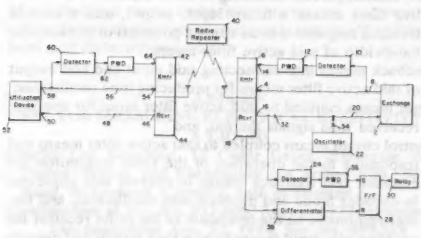
1. A programming system for controlling the selected transmission of a signal at preselected times comprising a transmitter, a plurality of receivers, a plurality of relay means one for each of said receivers for connecting the corresponding receiver to said transmitter when such relay means is energized, a plurality of commutator means one for each of said relay means, each commutator means having a plurality of commutator circuits and being operable to select one of its commutator circuits and provide a connection between said relay means and the selected one of the commutator circuits thereof, and means to provide power to the commutator circuits of said commutator means at different preselected times to energize each of said relay means at a preselected time corresponding to the commutator circuit selected by the corresponding commutator means to thereby connect said transmitter to the corresponding receiver at the preselected time.

3,946,315

SINGLE FREQUENCY SIGNALLING IN A RADIOTELEPHONE COMMUNICATION SYSTEM WITH IDLE CONDITION SIGNAL GENERATOR AT ONE TERMINAL ACTIVATED BY ANOTHER TERMINAL

Galen F. Tustison, Palos Verdes, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 27, 1975, Ser. No. 591,211
Int. Cl.² H04M 7/16, 3/20; H04B 1/38
U.S. Cl. 325—55 7 Claims



1. A communication system comprising at least two radio frequency terminals and a radio frequency repeater wherein at least one of the terminals comprises, in combination:

a land based telephone system;

a first radio frequency transmitter coupled to said land based telephone system;

a first radio frequency receiver coupled to said land based telephone system;

means for turning said first transmitter off whenever and so long as said telephone system generates an idle circuit condition signal to said first transmitter;

means for generating an idle circuit condition signal;

means for coupling said means for generating an idle circuit condition signal to said telephone system whenever an idle circuit condition signal is received by said first receiver for longer than a first time interval; and

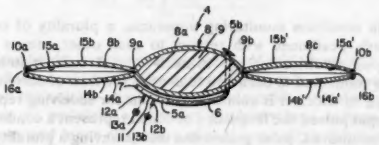
means for uncoupling said means for generating idle circuit condition signal from said telephone system upon the occurrence of a received radio frequency signal by said first receiver.

3,946,316

RADIO-PILLOW DEVICE

William T. Hough, 312 S. Finley Ave., Basking Ridge, N.J. 07920

Filed Nov. 14, 1974, Ser. No. 523,908
Int. Cl.² H04B 1/06
U.S. Cl. 325—310 11 Claims



1. A radio-pillow device comprising in combination: a tubular flexible material divided into at least two segregated portions one from the other, with each portion defining therein a space, a first one of said portions having an open tubular end and at least a first aperture, and an adjacent second one of said portions having its respective defined space thereof substantially totally enclosed such that pillow stuffing is retainable therein, the second portion being closed at each of opposite ends of its space thereof, a portion of the tubular flexible material defining said first portion being invertible and thereby enclosable of and around said second portion; a radio means for receiving radio waves and converting the radio waves to sound waves, the radio means being of a predetermined miniature size and substantially flattened in shape such that it is positionable adjacent an outer surface of said second portion and within an enclosure of the first portion when said first portion is in an inverted state enclosing the second portion, said radio means including at least volume and tuning shaft elements extending outwardly for extending through said first aperture.

3,946,317

RADIO RECEIVER

Satoshi Ishimaru, Kashihara, and Shoitsu Nakano, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Company, Ltd., Osaka, Japan

Filed Aug. 6, 1974, Ser. No. 495,201
Claims priority, application Japan, Aug. 9, 1973, 48-94311[U]; Aug. 15, 1973, 48-96202[U]; Oct. 4, 1973, 48-116601[U]; Oct. 4, 1973, 48-116602[U]; Oct. 11, 1973, 48-118659[U]; Oct. 11, 1973, 48-118660[U]; Nov. 7, 1973, 48-129156[U]; Nov. 8, 1973, 48-129632[U]
Int. Cl.² H04B 1/08
U.S. Cl. 325—354 8 Claims

8. A radio receiver, comprising:

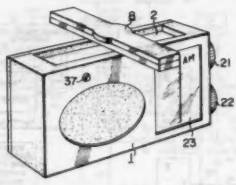
a cabinet having a chassis mounted therein on which radio receiving electric circuit components are disposed;

a recess formed in a top portion of said cabinet and having a tubular bearing portion extending inwardly of said cabinet from said recess;

a casing having a rod-like antenna housed therein, said casing having an elongated stem portion extending into said bearing portion, said stem portion having a plurality

of axial grooves formed on an outer peripheral surface thereof;

means supporting said stem portion in said bearing portion for rotational and axial movement relative to said bearing portion, said stem portion and said antenna casing being movable between axially extended and axially retracted positions; and



a resilient member mounted to said cabinet and having one end extending into engagement with one of said stem portion axial grooves in said axially extended position of said stem portion, said antenna casing being rotatable about the axis of said stem portion against the force applied by said resilient member.

3,946,318

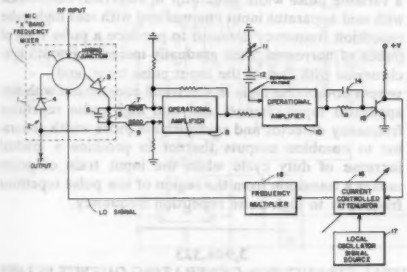
AUTOMATIC LEVEL CONTROL CIRCUIT FOR LOCAL OSCILLATOR SIGNALS WITH THE LEVER CONTROL SIGNAL BEING DERIVED FROM THE DC CURRENT PRESENT IN THE DIODE CIRCUIT OF AN MIC FREQUENCY MIXER

Alan Herbert Gruber, Cedar Grove, N.J., assignor to International Telephone & Telegraph Corporation, Nutley, N.J.

Filed Dec. 12, 1974, Ser. No. 532,108

Int. Cl.² H04B 1/16

U.S. Cl. 325—411 **10 Claims**



1. An automatic level control circuit for local oscillator signals coupled to frequency mixers comprising:

a first source of radio frequency signals;

a second source of local oscillator signals;

a frequency mixer including a hybrid junction coupled to said first source and a circuit having a pair of series connected diodes therein coupled to said hybrid junction;

first means coupled to said circuit to derive a level control signal from the direct current flowing in said circuit; and

second means coupled to said second source, said hybrid junction and said first means, said second means being responsive to said control signal to maintain said local oscillator signals coupled to said hybrid junction at a selected constant level.

3,946,319

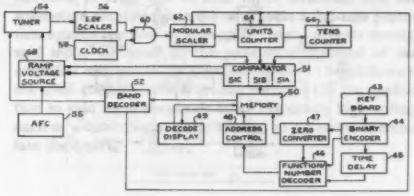
ALL ELECTRONIC DIGITAL TUNER SYSTEM WITH MEMORY

John Ma, Glenview, and Akio Tanaka, Evanston, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed May 3, 1974, Ser. No. 466,579

Int. Cl.² H04B 1/16

U.S. Cl. 325—459 **10 Claims**



1. An all-electronic television tuning system comprising:

voltage controllable oscillator means for selectively tuning a plurality of fixed frequency bandwidth television channels in a predetermined range of frequencies;

encoding means converting the tuning frequency of said oscillator means into channel number information;

channel number selection means;

comparison means comparing channel number information from said encoding means and said selection means;

voltage generating means for changing the tuning frequency of said voltage controllable oscillator means under the control of said comparison means;

memory means coupled between said selection means and said comparison means including a plurality of memory locations;

said television tuning system having a program mode permitting the storage of channel number information from said selection means in said memory means, an operate mode permitting recall of channel number information from said memory means for supplying input information to said comparison means and means coupled to said memory means for establishing either of said modes; and

said memory means having a particular location accessible only in said operate mode for channel number information storage to cause immediate tuning to the corresponding channel.

3,946,320

SIGNAL PROCESSOR FOR DOPPLER TYPE NAVIGATION SYSTEM

Francis G. Overbury, Cuffley; Paul Barton, Bishops Stortford, and Kevin M. Kelly, Sawbridgeworth, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 27, 1975, Ser. No. 553,480

Claims priority, application United Kingdom, Apr. 25, 1975, 18084/74

Int. Cl.² H04B 1/34

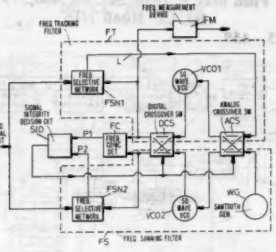
U.S. Cl. 325—470 **5 Claims**

1. In a Doppler Navigation receiver for deriving angular position information from received signals transmitted from a remote commutated array ground beacon, signal processing apparatus for frequency tracking the direct path signal and avoiding the tracking of frequencies corresponding to multipath signals, comprising:

a frequency tracking circuit responsive to said received signals, said tracking circuit being responsive to a control signal to lock onto and track a discrete signal within the range of frequencies contained within said received signals;

a frequency scanning circuit for scanning said range of received signal frequencies, including detection means to

generate said control signal at any time when a signal amplitude within said range of received signals exceeds the amplitude of said discrete signal being tracked at the same time by said frequency tracking circuit;

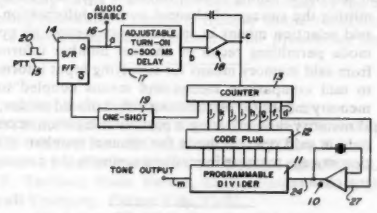


and switching means responsive to said control signal to cause at least a portion of said frequency scanning circuit to assume the role of frequency tracking, at least a portion of said frequency tracking circuit being controlled to contemporaneously assume the role of frequency scanning.

3,946,321
DIGITAL ENCODER

Kenneth J. Krolik, San Jose, Calif., assignor to Motorola, Inc., Chicago, Ill.

Filed Oct. 15, 1974, Ser. No. 514,718
Int. Cl.² H03B 19/00; H03K 21/00
U.S. Cl. 328—25 **4 Claims**



1. A digital encoder comprising:

a. an oscillator including a two input logic gate amplifier and a ceramic resonator in a phase changing feedback network connected between an input and an output of said logic gate amplifier and providing a continuous signal during proper energization thereof;

b. a programmable divider connected to receive the continuous signal from said oscillator and provide a signal at an output which has a frequency equal to the frequency of the continuous signal divided by a predetermined divisor, said divider having a plurality of inputs for receiving different signals thereon representative of different predetermined divisors;

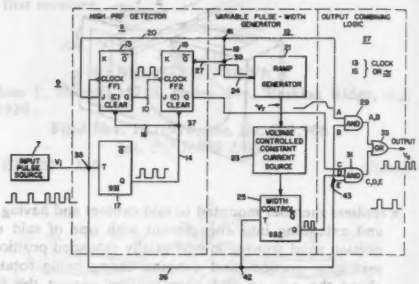
c. memory means including a read-only memory code plug having a plurality of outputs connected to the plurality of inputs of said programmable divider and a plurality of corresponding inputs, said memory means providing signals on each of the plurality of outputs representative of a different predetermined divisor in response to an activating signal being applied to the corresponding input; and

d. timing means connected to the plurality of inputs of said memory means for providing activating signals thereto in a predetermined sequence.

3,946,322
PULSE DUTY CYCLE TRANSITION MODERATING DEVICE

Joel Katz, Los Angeles, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 17, 1974, Ser. No. 479,738
Int. Cl.² H03K 5/04, 5/20, 1/16, 7/00
U.S. Cl. 328—58 **6 Claims**



1. A duty cycle transition moderating system which comprises:

a. an apparatus input channel to receive an input pulse train having a high pulse repetition frequency region and a low pulse repetition frequency region, the transition from low to high pulse repetition frequency occurring when the pulse period becomes equal to or less than t_1 when the pulse train is applied to the system said detector including means for producing a pulse of width t_1 in response to the leading edge of the pulse of said input pulse train;

b. a high repetition frequency detector in electrical connection with said apparatus input channel to sense a change of frequency of the pulses of said input pulse train from the region of low pulse repetition frequency to that of high pulse repetition frequency;

c. a variable pulse width generator in electrical connection with said apparatus input channel and with said high pulse repetition frequency detector to produce a pulse train of pulses of narrowed, then gradually increasing width synchronous with that of the input pulse train; and

d. output combining logic in electrical connection with said apparatus input channel and said high pulse repetition frequency detector and said variable pulse width generator to combine outputs thereof to produce a gradual increase of duty cycle when the input train of pulses makes a transition from the region of low pulse repetition frequency to high pulse repetition frequency.

3,946,323
DIGITAL CIRCUIT FOR GENERATING OUTPUT PULSES SYNCHRONIZED IN TIME TO ZERO CROSSINGS OF INCOMING WAVEFORMS

Bjorn E. Bjerede, San Diego, Calif., assignor to General Dynamics Corporation, San Diego, Calif.

Filed July 25, 1974, Ser. No. 491,731
Int. Cl.² H03K 1/17; H03B 3/04; H03K 5/13
U.S. Cl. 328—63 **10 Claims**

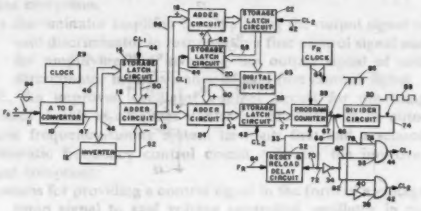
1. A digital phase locked loop circuit for generating timing pulses synchronized with zero-crossings of a periodic input data signal comprising,

A to D converter means for continuously quantitizing to digital information the analog magnitude of a periodic input data signal,

storage means responsive to timing pulses for sampling and storing the digital quantum of said digital information at the time of said timing pulses,

counter means responsive to a given count respresentative of the stored digital quantum in said storage means for counting the given count in timed synchronism with the zero-crossing of the input signal and providing a carry pulse at the end of the count,

pulse circuit means for receiving the carry pulse and providing an updated timing pulse output in time synchronism



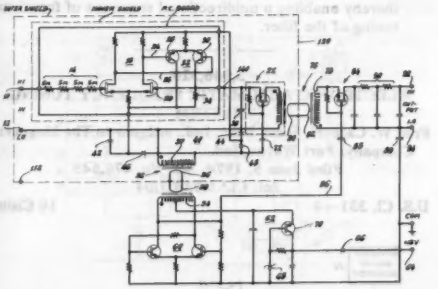
therewith, which timing pulse lags or leads the zero-crossing of the input data signal by the counting time of said counter means in counting said given count,

and means for feeding said updated timing output pulse to said storage means, whereby the time advance or time delay of the updated timing pulse moves in time the timing output pulse to time synchronism with the zero-crossings of the input data signal.

3,946,324
ISOLATION AMPLIFIER

Lewis R. Smith, Sudbury, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.

Continuation of Ser. No. 379,804, July 16, 1973, abandoned, which is a continuation of Ser. No. 181,344, Sept. 17, 1971, abandoned. This application Nov. 7, 1974, Ser. No. 521,930
Int. Cl.² H03F *3/38*
U.S. Cl. 330—10 **7 Claims**



7. An isolation amplifier especially adapted for use in medical applications where it is essential that no high level currents be permitted to flow into the amplifier input circuit, as from a patient's body to which the amplifier is connected, said amplifier comprising:

an input section having a pair of input terminals to which the signal source is to be connected;

said input section having circuit elements coupled to said input terminals comprising an amplifier element of solid-state material having at least hundreds of megohms normal resistance but subject to damage which could reduce the input resistance of the element to a much lower level;

said input section further including an AC modulator coupled to the output of said amplifier element to produce a modulated AC signal corresponding to the DC input signal applied to said input terminals;

an output section conductively isolated from said input section;

said output section including a demodulator arranged to receive the modulated AC signal from said input section and to produce a DC output signal corresponding to said DC input signal;

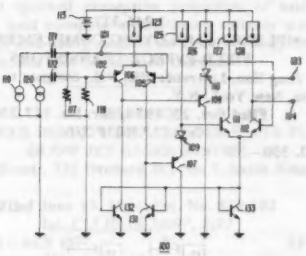
non-conductive circuit means coupling said modulated AC signal from said input section to said output section; and

at least one resistor of multi-megohm resistance connected between at least one of said input terminals and said solid-state amplifier element to provide a fail-safe protection against the flow of abnormally high currents through said input terminals to the solid-state material of said amplifier element in the event of either (1) breakdown of the solid-state material from any cause or (2) the application to said input terminals of an extremely high voltage such as a defibrillator pulse applied to a patient to stimulate the heart.

3,946,325
TRANSISTOR AMPLIFIER

Arthur John Leidich, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 5, 1974, Ser. No. 486,243
Int. Cl.² H03F *3/04, 3/68*
U.S. Cl. 330—22 **13 Claims**



1. The combination of:

first and second transistors of opposite conductivity types, each of said first and said second transistors having base and emitter electrodes with a base-emitter junction therebetween and having a collector electrode connected to that of the other at an interconnection;

means for applying a reference potential to the emitter electrode of said first transistor;

means for applying a forward bias potential between the emitter and base electrodes of said first transistor;

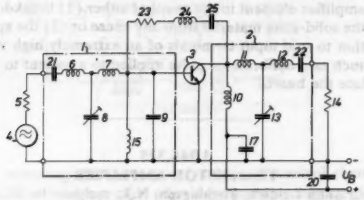
means for maintaining a potential between the emitter and collector electrodes of said first transistor which has a quiescent value substantially one-half as large as that of said forward bias potential; and

further means connecting said second transistor as an amplifier with collector loading, said further means including means for applying an input signal between the base and emitter electrodes of said second transistor, said input signal having a direct component associated therewith related to said reference potential.

3,946,326
TRANSMITTER AMPLIFIER

Willy Minner, Schwaiger, and Jörn Müller, Aufheim, both of Germany, assignors to Licentia Patent- Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Mar. 30, 1973, Ser. No. 346,270
Claims priority, application Germany, Mar. 30, 1972, 2215540
Int. Cl.² H03F 1/26
U.S. Cl. 330—26 8 Claims

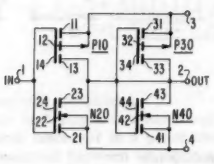


1. A transmitter amplifier comprising a transistor forming a class B or C amplifier element, an output circuit for said transistor, an input circuit for said transistor and a low-pass filter connecting said output circuit and said input circuit and having a limiting frequency below the intended frequency band of the amplifier.

3,946,327
AMPLIFIER EMPLOYING COMPLEMENTARY FIELD-EFFECT TRANSISTORS

Sheng Teng Hsu, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 23, 1974, Ser. No. 517,239
Int. Cl.² H03F 3/16
U.S. Cl. 330—35 10 Claims

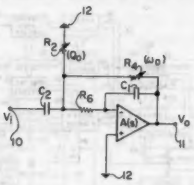


8. In combination:
a complementary field effect transistor amplifier having an input terminal, an output terminal and two operating potential supply terminals;
a first diode-connected field effect transistor connected between said output terminal and one of said supply terminals;
a second diode-connected field effect transistor connected between said output terminal and the other of said supply terminals; and wherein
each said diode-connected field effect transistor is poled in a sense to be forward biased upon application of an operating potential across said supply terminals thereby providing a voltage dependent load impedance for said amplifier which decreases as said operating potential increases.

3,946,328
FUNCTIONALLY TUNABLE ACTIVE FILTER

Stalin A. Boctor, Agincourt, Canada, assignor to Northern Electric Company, Limited, Montreal, Canada

Filed Jan. 27, 1975, Ser. No. 544,433
Int. Cl.² H03K 9/04
U.S. Cl. 330—107 10 Claims

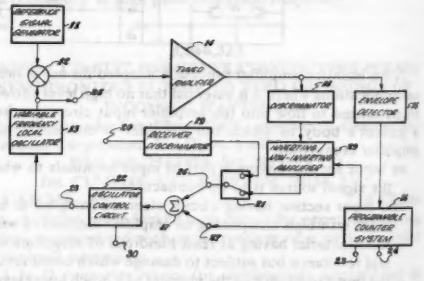


1. An RC functionally tunable active filter comprising:
input, output and common terminals;
a differential amplifier having inverting and noninverting inputs, and an output connected to the output terminal;
a first capacitor and a first resistor serially connected between the input terminal and the inverting input of the differential amplifier;
a second capacitor connected between the inverting input and the output of the differential amplifier;
a second resistor connected between the junction of the first capacitor and resistor, and the common terminal;
a third resistor connected between said junction and the output of the differential amplifier; and
conductive means connected between the noninverting input of the differential amplifier and the common terminal;
the differential amplifier, resistors, capacitors and conductive means coacting such that variations in resistance of the first and/or third resistors affect the pole resonant frequency ω_o, and variations in resistance of the second resistor affect the pole quality factor Q_o but not ω_o, thereby enabling a unidirectional sequence of functional tuning of the filter.

3,946,329
ELECTRONIC AUTOMATIC FREQUENCY TUNING SYSTEM

Fred W. Caspari, South Bend, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed June 5, 1974, Ser. No. 476,645
Int. Cl.² H03B 3/04
U.S. Cl. 331—4 10 Claims



5. An improved automatic frequency control circuit of the type utilizing beat frequency signals and having signal frequencies above and below reference signal components, said

AFC circuit having a reference signal generator, a voltage controlled oscillator, a mixing circuit for heterodyning the output signals of said reference signal generator and said voltage controlled oscillator to produce a beat frequency signal, and for providing an output signal of one polarity when said beat frequency signal is above a predetermined frequency and of the opposite polarity when said beat frequency signal in below said predetermined frequency, wherein the improvement comprises:

a discriminator amplifier for amplifying the output signal of said discriminator in response to a first control signal and for amplifying and inverting the output signal of said discrminator in the absence of said first control signal.

8. An improved oscillator control circuit for providing control signals to a voltage controlled oscillattor in an automatic frequency tuning system having a first and a second automatic frequency control circuit, wherein the improvement comprises:

means for providing a control signal in the form of a voltage ramp signal to said voltage controlled oscillator in response to an enabling signal from said automatic frequency tuning system;

storage means for temporarily providing a control signal of substantially constant value upon removal of said enabling signal;

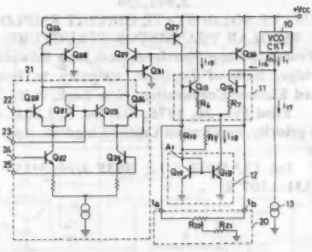
means for providing a control signal determined by an output signal of a first discriminator; and

means for providing a control signal determined by an output signal of a second discriminator when said first discriminator signal is substantially zero.

3,946,330
VOLTAGE CONTROLLED OSCILLATOR CIRCUIT

Nobuaki Takahashi, Yamato, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 25, 1975, Ser. No. 561,672
Claims priority, application Japan, Apr. 8, 1974, 49-39901
Int. Cl.² H03K *3/282*
U.S. Cl. 331—8 **6 Claims**

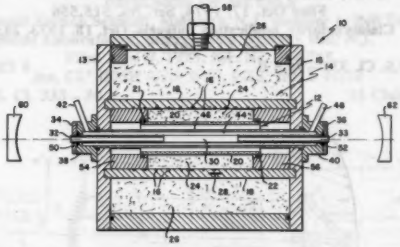


1. A voltage controlled oscillator circuit comprising: a voltage controlled oscillator means for generating a signal having a frequency which is proportional to an input control current; a first constant-current circuit means for producing a first constant current; current dividing means having a pair of points to which a control voltage is applied from the outside, said dividing means dividing said first constant current in accordance with the control voltage; a second constant-current circuit means for producing a second constant current; means for supplying a current which is equal to the sum of one part of said divided current and said second constant current, said sum current forming said input control current to said voltage controlled oscillator; and adjusting means for adjustably varying said control voltage, whereby the output current of said current dividing means is adjusted, and the free-running oscillation frequency of said voltage controlled oscillator is adjusted.

3,946,331
NERNST LAMP FOR LASER PUMPING

Slava A. Pollack, Palos Verdes Estates, Calif., and Van O. Nicolai, Reston, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 30, 1974, Ser. No. 465,464
Int. Cl.² H01S *3/091*
U.S. Cl. 331—94.5 P **8 Claims**



1. A laser apparatus comprising:

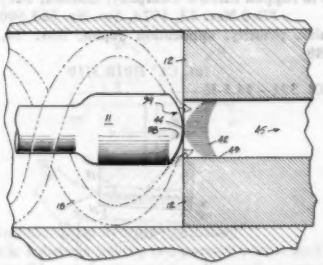
laser means with a lasing medium adapted to absorb energy of a specific frequency range; and

pumping means with a radiating source formed from an electrically conductive ceramic doped with specially chosen oxides so that a selective thermal radiator is formed with emissivity properties approximately matching the spectral absorption properties of said lasing means, said pumping means being suitably positioned adjacent said lasing medium so that the energy from said pump means may be radiated thereon.

3,946,332
HIGH POWER DENSITY CONTINUOUS WAVE PLASMA GLOW JET LASER SYSTEM

Michael A. Samis, 726 Orchard St., No. 7, Santa Rosa, Calif. 95404

Filed June 13, 1974, Ser. No. 479,102
Int. Cl.² H01S *3/097, 3/22*
U.S. Cl. 331—94.5 PE **53 Claims**



1. A high power density laser comprising in combination,

a. a gaseous medium,

b. means for inducing axially symmetrical supersonic flow of said gaseous medium,

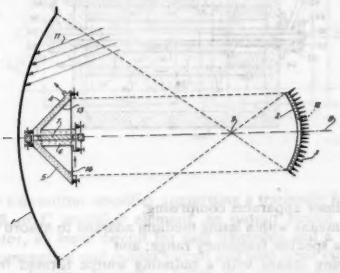
c. means for establishing an electrical glow discharge having axial symmetry across said supersonic flow for converting said gaseous medium into supersonically flowing plasma and excited gaseous species having low translational temperatures and a population inversion therein, and,

d. means for stimulating the emission of radiation energy from said flowing plasma and excited gaseous species for producing a laser beam.

3,946,333
APPARATUS FOR OPTICALLY PUMPING LASERS WITH SOLAR ENERGY

Onik Kevork Chitakyan, and Mihail Georgiev Shterev, both of Burgas, Bulgaria, assignors to Republikanski Centar sa TNTM, Sofia, Bulgaria

Filed Oct. 17, 1974, Ser. No. 515,556
Claims priority, application Bulgaria, Oct. 18, 1973, 24351
Int. Cl.² H01S 3/091
U.S. Cl. 331—94.5 P 5 Claims

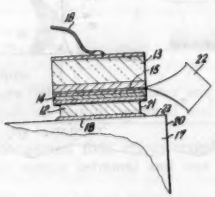


1. In a system for optically pumping a laser with solar energy, a first concave reflector supported about an optical axis for collecting solar energy, a second concave reflector facing a front surface of the first reflector and disposed in confocal relation with the first reflector about the optical axis, a third reflector spaced from the second reflector in a direction toward the first reflector, the third reflector comprising a pair of planar walls diverging toward the second reflector at substantially equal acute angles to the optical axis, and means for supporting the laser on the optical axis between the diverging walls of the third reflector.

3,946,334
INJECTION SEMICONDUCTOR LASER DEVICE

Hiroo Yonezu, and Tonao Yuasa, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Nov. 13, 1974, Ser. No. 523,500
Claims priority, application Japan, Nov. 14, 1973, 48-131588
Int. Cl.² H01S 3/19
U.S. Cl. 331—94.5 H 5 Claims

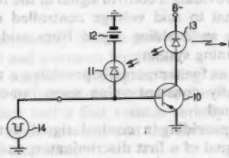


1. In a stripe-geometry semiconductor laser device of the type including a pair of parallel, smooth, flat reflecting surfaces forming an optical resonator, and an elongated laser-active region normal to the reflecting surfaces, the improvement which comprises: an ohmic metal film on the side of a heat sink near said laser-active region plated with a thermally conductive layer, wherein said thermally conductive layer is shorter than the optical resonator and is of a sufficient thickness to protect the laser device from being damaged in the process of bonding the laser device to the heat sink, thereby to facilitate the control of mounting accuracy and prevent output light rays emerging through one of the reflecting surfaces from impinging upon the surface of the heat sink.

3,946,335
STABILIZATION CIRCUIT FOR RADIATION EMITTING DIODES

Bernard Collins De Loach, Jr., Murray Hill, and Mauro DiDomenico, Jr., Basking Ridge, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 18, 1975, Ser. No. 550,774
Int. Cl.² H01S 3/13
U.S. Cl. 331—94.5 S 4 Claims

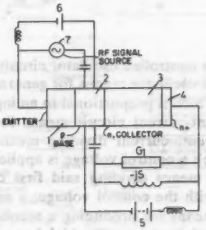


1. The combination comprising:
a transistor connected in the common emitter configuration;
a radiation emitting diode laser coupled between the collector and emitter electrodes of said transistor;
a photodetector coupled between the base and emitter electrodes of said transistor;
means for coupling a portion of the radiated output power from said diode to said photodetector;
and means for coupling an input signal between said base and emitter electrodes.

3,946,336
MICROWAVE SOLID STATE CIRCUIT EMPLOYING A BIPOLAR TRANSISTOR STRUCTURE

Jocelyn Froom, Bishop Stortford, and John Edward Carroll, Cambridge, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 26, 1975, Ser. No. 553,351
Claims priority, application United Kingdom, Apr. 25, 1974, 18123/74
Int. Cl.² H03B 9/12; H03F 3/19, 3/55
U.S. Cl. 331—107 R 4 Claims



1. A microwave solid state circuit comprising:
a bipolar transistor structure having a base region, an emitter region and a collector region;
first means coupled to said base region and said emitter region to apply a radio frequency input signal and a first bias voltage across the emitter-base junction so that cur-

rent modulated at the frequency of said input signal is injected into said collector region;

second means coupled to said base region and said collector region for reverse biasing the collector-base junction; and

third means coupled to said base region and said collector region for loading the collector-base junction such that said circuit operates as a selected one of an oscillator injection locked by said input signal and an amplifier of said input signal;

said collector region operating in an Impatt mode, and

said emitter region including a semiconductor material of higher energy gap than the semiconductor material of said base region.

4. A microwave solid state circuit comprising:

a bipolar transistor structure having a base region, an emitter region and a collector region;

first means coupled to said base region and said emitter region to apply a radio frequency input signal and a first bias voltage across the emitter-base junction so that current modulated at the frequency of said input signal is injected into said collector region;

second means coupled to said base region and said collector region for reverse biasing the collector-base junction; and

third means coupled to said base region and said collector region for loading the collector-base junction such that said circuit operates as a selected one of an oscillator injection locked by said input signal and an amplifier of said imput signal;

said collector region operating in a transferred electron mode, and

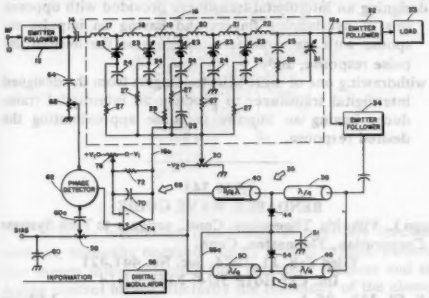
said emitter region including a semiconductor material of higher energy gap than the semiconductor material of said base region.

3,946,337

PHASE MODULATOR FOR PHASE SHIFT KEY COMMUNICATIONS SYSTEMS

William D. Philips, Fort Lauderdale, and William H. Franklin, Jr., Coral Springs, both of Fla., assignors to The Bendix Corporation, Southfield, Mich.

Filed Apr. 25, 1975, Ser. No. 571,465
Int. Cl.² H03C 3/22; H04L 27/20
U.S. Cl. 332—22 **5 Claims**



1. A phase modulator comprising

means for generating a raw carrier frequency;

means responsive to a control signal for shifting the phase of said raw carrier frequency to produce a phase shifted carrier frequency;

at least first and second means, a signal applied to said first means being shifted a predetermined number of electrical degrees with respect to a signal applied to said second means;

switch means for applying a sample of said phase shifted carrier frequency to one of said first and second means and subsequently to the other of said first and second means in accordance with information to be conveyed by said phase shifted carrier frequency;

phase detector means for generating an output signal related to the phase difference between said raw carrier frequency and the signal from said first and second means; and,

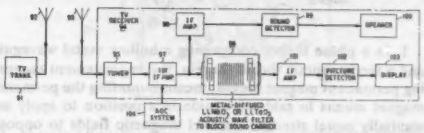
low pass filter means responsive to said output signal for generating the control signal for said means for shifting.

3,946,338

ACOUSTIC WAVE DEVICES INVOLVING PERTURBATION OF ACOUSTIC VELOCITY BY DIFFUSION OF METALS

Ronald Vernon Schmidt, Matawan, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 9, 1975, Ser. No. 584,765
Int. Cl.² H03H 9/26, 9/30, 9/32; H01L 41/18
U.S. Cl. 333—30 R **16 Claims**



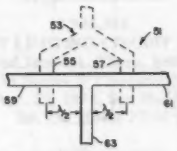
1. An electronic device comprising a body of material capable of propagating acoustic waves, said body comprising at least one region of lithium niobate, first transducer means attached to said body to couple acoustic waves into said region, and second transducer means attached to said body for coupling acoustic waves out of said region, characterized by the improvement for selective transmission of acoustic waves in a particular frequency band that said lithium niobate region includes a pattern of portions into which a metal has been diffused to provide increased acoustic wave velocity in those portions.

3,946,339

SLOT LINE/MICROSTRIP HYBRID

Henry G. Oltman, Jr., Woodland Hills; Nathan Peiner, Los Angeles, and Eugene N. Torgow, Northridge, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 29, 1974, Ser. No. 528,045
Int. Cl.² H01P 5/16
U.S. Cl. 333—11 **3 Claims**



1. slot line/microstrip hybrid, comprising:

a dielectric substrate having two parallel planar surfaces;

a relatively thin conductive coating disposed on one of said planar surfaces, a T-shaped three port slot line hybrid component being defined by a relatively narrow slot in said conductive coating;

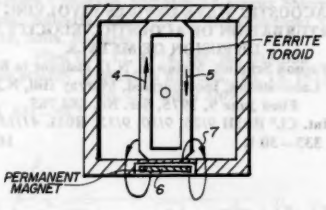
a split arm single port microstrip line hybrid component of conductive material disposed on the other of said planar surfaces, the longitudinal axes of the portions of the split arm hybrid component adjacent two coaxial arms of said T-shaped hybrid component being on opposite sides of and essentially parallel to the transverse arm of said T-shaped hybrid component.

3,946,340

PHASE SHIFTER

Joseph William Simon, Doraville, Ga., assignor to Electromagnetic Sciences, Inc., Atlanta, Ga.

Filed Mar. 18, 1974, Ser. No. 452,457
Int. Cl.² H01P 1/40
U.S. Cl. 333—24.1 **3 Claims**



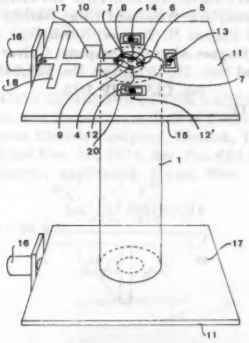
1. In a phase shifter comprising a hollow metal waveguide and a ferrimagnetic toroid therein, the improvement comprising permanent magnet means, means mounting the permanent magnet means to said waveguide in a position to apply substantially equal strength parallel magnetic fields to opposite sides of said toroid in a direction perpendicular to the axis of said toroid, said magnetic fields being opposite to the direction of magnetization in one of said opposite sides and parallel to the direction of magnetization in the other side, so as to reduce the magnetization of the toroid.

3,946,341

BROADBAND ELECTROACOUSTIC DELAY LINES

Bernard Chiron; Jean Puyhaubert, and Michel Seguin, all of Paris Cedex, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris Cedex, France

Filed Jan. 6, 1975, Ser. No. 539,032
Int. Cl.² H03H 9/26, 9/30, 9/32; H01L 41/10
U.S. Cl. 333—30 R **2 Claims**



1. An elongated acoustic delay medium having a pair of planar substrates parallel to each other and one supported at opposite ends of said medium respectively;

at least four transducers, two located on each end of said delay medium in spaced relation to each other forming at least two acoustically decoupled transducer pairs interconnected by said delay medium to convert electrical energy within a given operating frequency band into acoustic energy and vice versa;

at least four impedance matching sections, two on each substrate, each section having two electrical terminals;

a pair of stripline impedance transformers, one carried on each of said substrate respectively;

means connecting the transducers on each end of said delay medium to one end of the impedance transformer on that substrate at the same end as said transducers;

means connecting each transducer on each end of said delay medium to one terminal of a different one of said impedance matching sections on the same end as said transducers respectively;

means connecting the second terminal of each said impedance matching sections to ground; and

means affording connection of electrical energy to or from the opposite end of each of said stripline impedance transformers;

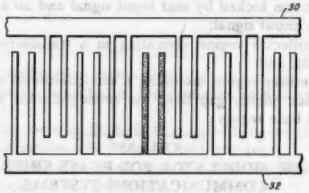
the resonant frequencies of each transducer and its connected matching section being different and within the operating band.

3,946,342

WEIGHTING SURFACE WAVE FILTERS BY WITHDRAWING ELECTRODES

Clinton S. Hartmann, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 10, 1973, Ser. No. 387,561
Int. Cl.² H03H 9/20, 9/26; H01L 41/10, 41/22
U.S. Cl. 333—72 **18 Claims**



1. A method for fabricating an acoustic surface wave interdigital transducer having an impulse response with predetermined relative amplitudes along the length thereof, said method comprising:

defining the desired impulse response of the interdgital transducer to be fabricated,

designing an interdigital transducer provided with opposed sets of overlapping fingers and having an impulse response with the same zero-crossings as the desired impulse response, and

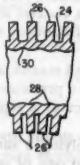
withdrawing one or more selected fingers from the designed interdigital transducer to produce an interdigital transducer having an impulse response approximating the desired response.

3,946,343

BENDABLE WAVE GUIDE

Hugo L. Vilkaitis, Thomaston, Conn., assignor to Tech Systems Corporation, Thomaston, Conn.

Filed Feb. 11, 1974, Ser. No. 441,421
Int. Cl.² H01P 3/14; F16L 11/14
U.S. Cl. 333—95 A **3 Claims**



1. A rectangular bendable wave guide for the transmission of microwave energy, said wave guide to be used in a range

having a low limit frequency which is 20% below a center frequency and a high limit frequency 20% above said center frequency, the width of the inner cross section of the wave guide being defined by the formula:

$$w = 0.755\lambda$$

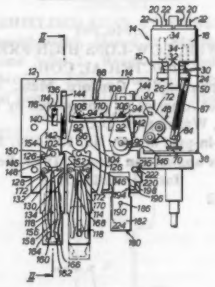
where w is the inner cross-sectional width of the wave guide in centimeters and λ is the wavelength in free space in centimeters of microwave energy at said center frequency, said wave guide comprising a bendable tubular member of rectangular cross section for the transmission of microwave energy therethrough, said bendable tubular member having electrical conductivity and ductility and having a smooth inner surface and an outer surface having ridges and furrows, said ridges and furrows entending substantially transverse the direction of propagation of microwave energy through said tubular member, said ridges being thick enough to maintain the cross-sectional shape of said bendable tubular member during flexure thereof, and said furrows being thin enough to allow said bendable tubular member to be bent, there being at least 12 furrows per wavelength in the wave guide along the length of said bendable tubular member for the high limit frequency of said range, and coupling means at each of the ends of said bendable tubular member for coupling each of said ends of said bendable tubular member to a microwave device.

3,946,344

PUSH-BUTTON TUNING MECHANISM

Alfred Wilkinson, Ringwood, England, assignor to Sydney S. Bird and Sons Limited, Dorset, England

Filed Nov. 12, 1974, Ser. No. 523,090
Int. Cl.² H03J 5/12
U.S. Cl. 334—7 **15 Claims**



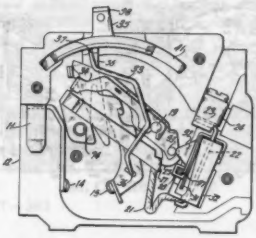
1. A tuner mechanism comprising at least one reactance element, manually operable tuning control means, transmission means interconnecting said reactance element and said tuning control means whereby the reactance of the element is varied by operation of the tuning control means, a movable member connected to said transmission means and adapted to be translationally moved by operation of said tuning control means, at least one actuating member means guiding said actuating member for movement towards and away from said movable member, planar cam means associated with said actuating member, means coplanar with said cam means arranged to adjust the orientation of said cam means, said cam means being adapted to interact with said movable member on movement of said actuating member towards the movable member to translationally move the movable member to a position determined by the orientation of the cam means, and a clamping member, extending within the plane of said cam means, arranged to clamp the cam means in said predetermined orientation.

3,946,345

NARROW MULTI-POLE CIRCUIT BREAKER HAVING INERTIA ACTUATED OVERTRAVEL FOR LATCH RELEASE

Carl E. Gryctko, Haddon Heights, N.J., and Charles T. Robins, Swarthmore, Pa., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Mar. 4, 1975, Ser. No. 555,167
Int. Cl.² H01H 75/12
U.S. Cl. 335—9 **8 Claims**



1. A circuit breaker having a plurality of poles and including, for each pole thereof, cooperating contact means, releasable operating means for opening and closing said contact means, latch means for maintaining said operating means in operative condition to close said contact means, and fault current responsive trip means which when actuated trips said latch means to release said operating means which renders the latter inoperative to either close or maintain said contact means closed; said trip means including an electromagnet comprising a relatively stationary magnetic frame and a magnetic armature movable from a normal forward position rearward through a latch releasing position upon predetermined energization of said electromagnet, tie means interconnecting said armatures of said plurality of poles for simultaneous operation thereof; biasing means for said armature urging the latter toward said normal position; within a pole carrying fault current said armature being moved rearward magnetically past said latch releasing position; said trip means also including thermally responsive means for automatically releasing said operating means at overload current below said fault current; said operating means upon release thereof by said thermally responsive means operatively engaging said armature thereby moving the armatures of all poles substantially to the rear of their said latch releasing positions.

3,946,346

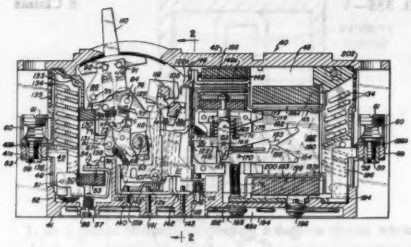
CURRENT LIMITING CIRCUIT BREAKER

Clark L. Oster, and James A. Tharp, both of Cedar Rapids, Iowa, assignors to Square D Company, Park Ridge, Ill.

Filed Apr. 29, 1974, Ser. No. 465,011
Int. Cl.² H01H 77/10
U.S. Cl. 335—16 **6 Claims**

1. In an electromagnetically operable circuit interrupting device comprising an outer molded case, a magnetic core disposed in the outer case, a conductor turn disposed in the outer case and associated with the magnetic core, an armature disposed in the outer case, normally in spaced relationship to the magnetic core, and attracted toward the magnetic core upon flow of a predetermined current in the conductor turn, an inner case disposed in the outer case adjacent the armature on an opposite side thereof from the magnetic core, wherein the improvement consists of an armature pin secured to the armature and having a portion reciprocally mounted in the inner case, a first contact blade having a mounting end portion disposed in the inner case and a contact end portion disposed outwardly of the inner case, a second contact blade having a mounting end portion disposed in the inner case and a contact end portion disposed outwardly of the inner case, each of the

contact blades having a contact mounted on the contact end portion thereof and engaged with the contact on the contact end portion of the other of the contact blades when the contact blades are in a closed position, means in the inner case on one side of a longitudinal axis of the armature pin pivotally



mounting the first contact blade, means in the inner case on the other side of the longitudinal axis of the armature pin pivotally mounting the second contact blade, means operatively connecting the armature pin with the contact blades, and spring means in the inner case biasing the contact blades toward the closed position.

3,946,347

ELECTROMAGNETIC RELAY STRUCTURE

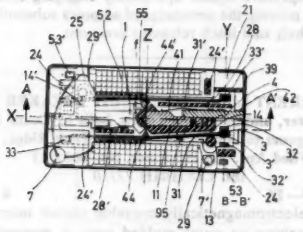
Hans Sauer, Deisenhofen, near Munich, Germany, assignor to Matsushita Electric Works Ltd., Osaka, Japan

Filed Dec. 28, 1973, Ser. No. 429,273

Claims priority, application Germany, Apr. 13, 1973, 2318812

Int. Cl.² H01H 50/04

U.S. Cl. 335—202 **72 Claims**



1. In an electromagnetic relay structure having an armature, coil means, contact means including contact terminals and fixed contacts and a coil holder body having said armature located therein, said coil holder body being composed of two substantially exactly interfitting and interconnected parts, the improvement wherein one part only of said two parts of said coil holder body is formed as a contact holder having firmly embedded therein said fixed contacts and said contact terminals, with said contact terminals projecting therefrom to the exterior thereof, and wherein said other of said two parts is formed as a cover member to at least partly define a contact containing chamber.

3,946,348

RADIATION RESISTANT DUCTED SUPERCONDUCTIVE COIL

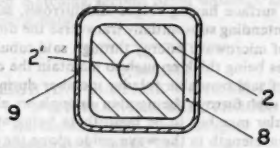
Armin Schleich, Zurich, Switzerland, assignor to BBC Aktiengesellschaft Brown, Boveri & Cie., Baden, Switzerland

Division of Ser. No. 234,728, March 15, 1972. This application May 1, 1974, Ser. No. 466,073

Claims priority, application Switzerland, Mar. 22, 1971, 4177/71

Int. Cl.² H01F 7/22

U.S. Cl. 335—216 **2 Claims**



1. An electrical superconductive coil formed by a helically wound insulated electrical conductor and which exhibits a high degree of resistance when exposed to strongly ionizing radiation, said electrical conductor being constituted by an electrically conductive core of superconductive material and which is provided with an internal longitudinally extending cooling duct, an insulating layer consisting of inorganic insulating material applied to said conductor core and an electrically conductive metallic gas-tight sheath completely covering the layer of inorganic insulating material, the metallic sheaths on adjacent turns of the coil being secured together.

3,946,349

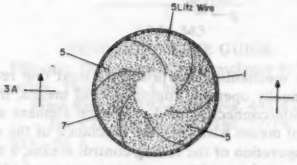
HIGH-POWER, LOW-LOSS HIGH-FREQUENCY ELECTRICAL COIL

Charles W. Haldeman, III, Concord, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 139,400, May 3, 1971, abandoned. This application Aug. 3, 1973, Ser. No. 385,363

Int. Cl. H01f 27/10

U.S. Cl. 336—62 **10 Claims**



1. An improved high-power, low-loss, high-frequency electrical coil comprising:

a. at least one turn of Litz wire having a clear unobstructed center channel through which a cooling fluid may be pumped, there being no element between said Litz wire and said center channel, said wire being wound in a circular pattern,

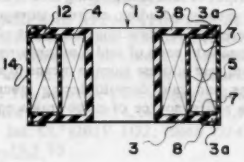
b. an electrical insulating material with mechanical strength in which the Litz wire is imbedded.

3,946,350

COIL ASSEMBLY FOR BOBBIN WOUND TRANSFORMER

Katsuichi Goto, c/o Tokyo Keidenki Kabushiki Kaisha, 4-3, Tamagawa 2 chome, Ota, Tokyo, Japan

Filed Mar. 26, 1975, Ser. No. 562,019
Int. Cl.² H01F 27/32
U.S. Cl. 336—208 5 Claim



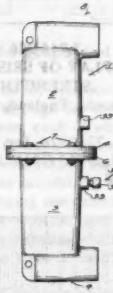
1. A coil assembly for a bobbin wound transformer comprising in combination: a bobbin having a hollow cylindrical body and a pair of radially extending flanges at the axially opposed ends of said body; an inner coil winding wound around said bobbin body; a molded substantially rigid spacer member of synthetic resin mounted on said bobbin and positioned concentrically on said bobbin body in overlying electrically insulated relation to said inner coil winding and a pair of radially extending flanges integral with the spacer member at the axially opposed ends thereof, the flanges of said spacer member being juxtaposed in parallel contiguous relation to and axially inwardly of said bobbin flanges; and an outer coil winding wound around said spacer member concentric to said inner coil winding and insulated therefrom by said spacer member, said spacer member comprises complementary sections having axially extending edges which are forced together to secure the spacer member on said bobbin body.

3,946,351

SHIELDED FUSE ASSEMBLY

Raymond J. Bronikowski; James R. Marek, both of South Milwaukee, and John L. Barger, Greendale, all of Wis., assignors to McGraw-Edison Company, Elgin, Ill.

Filed Feb. 28, 1975, Ser. No. 554,131
Int. Cl.² H01H 85/00
U.S. Cl. 337—224 16 Claims



1. Apparatus of the type described comprising in combination,

a housing of electrical insulating material including means defining an interior chamber and means defining first and second spaced terminal means communicating with said chamber,

an electrical device positioned in said chamber and connected to said terminal means, said electrical device completing an electrical circuit between said terminal means under normal circuit conditions and operative to interrupt said electrical circuit at a preselected abnormal circuit condition,

first and second shields of electrically conductive material each electrically connected to a respective one of said terminal means, said shields positioned wholly within and completely surrounded by the material of said housing,

and said first and second shields being spaced apart so that a closed electrical circuit between said first and second terminals does not exist through said shields,

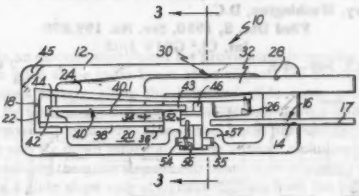
so that both when said electrical device completes and interrupts said electrical circuit all voltage stress occurs from said shields across the housing material and not from the electrical device and across any part of the chamber.

3,946,352

THERMALLY RESPONSIVE SWITCH

Hjalmar N. Nelson, Weymouth, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 9, 1974, Ser. No. 530,915
Int. Cl.² H01H 37/12
U.S. Cl. 337—361 18 Claims



1. A thermally responsive switch comprising a casing, first terminal means, complementary terminal means cooperating with said first terminal means to define a current path through said switch, said complementary terminal means having a contact arm portion movable between positions engaging and disengaging said first terminal means to open and close said circuit path through said switch and resiliently biased to one of said positions, means on said casing slidably receiving said first and complementary terminal means for precisely locating said terminal means within said casing, a multilayer thermostatic member movable in a predetermined manner in response to predetermined changes in temperature thereof, and means on said casing slidably receiving said thermostatic member for precisely locating said thermostatic member outside said circuit path in position to move said terminal arm portion between said open and closed circuit positions in response to said selected changes in temperature of said member.

3,946,353

MOUNTING SYSTEM FOR INFRARED TUBES

James G. Gallagher, 110 Fell Ave., N. Vancouver, British Columbia V7P 2J9, Canada

Filed Dec. 11, 1974, Ser. No. 531,597
Int. Cl.² H01C 1/014
U.S. Cl. 338—318 10 Claims

10. In combination:

a coil a tube housing the coil,

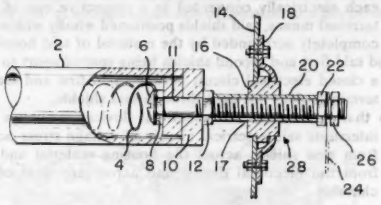
a dielectric end plug closing an end of the tube said plug having an axial through-bore,

a bolt extending through said plug bore,

a spacer on the bolt between the head of the bolt and the plug, one end of the coil being held between said head and the spacer, and the spacer bearing against the plug,

a nut threaded onto the bolt and clamping the plug between the nut and the spacer, and

a spacer sleeve on the bolt seated against said nut, a second nut threaded onto the bolt and bearing against the outer



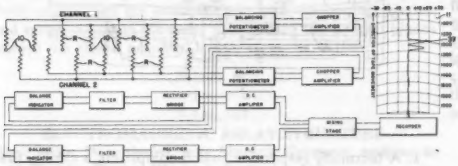
end of said sleeve, and a third nut threaded onto the bolt clamping an electrical lead against said second nut.

3,946,354

UNDERWATER ELECTRICAL POTENTIAL DETECTION SYSTEM

William G. Keck, East Lansing, Mich., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 8, 1950, Ser. No. 199,899
Int. Cl.² G01V *3/08*
U.S. Cl. 340—4 E **7 Claims**



1. A system of recording the passage of a vessel through a harbor entrance comprising a first plurality of equally spaced devices arranged transversely of the harbor entrance, said devices being adapted to respond to the potential field of a vessel as the vessel moves adjacent thereto, a second plurality of similar devices in alignment with the first devices and spaced midway therebetween respectively, third and fourth pluralities of similar devices alternately spaced midway between said first and second devices respectively and in alignment therewith, a pair of means respectively connected to said first and second and said third and fourth devices for receiving a response signal from said first and second devices and simultaneously receiving a response signal from said third and fourth devices respectively as the vessel moves adjacent thereto, means connected to said pair of means for adding said response signals together to produce a resultant signal, and recording means responsive to said resultant signal for producing a record indicative of the amplitude thereof.

3,946,355

MULTIPLEXING DEVICE FOR PANORAMIC SONAR SYSTEMS

Charles Bertolino, Six-Fours-les-Plages, France, assignor to Etat Francais, Paris, France

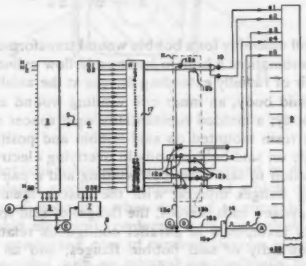
Filed Sept. 4, 1974, Ser. No. 503,155
Claims priority, application France, Sept. 17, 1973, 73.33197
Int. Cl.² G01S *3/80*
U.S. Cl. 340—6 R **6 Claims**

1. A multiplexing system for a panoramic sonar used in the formation of listening channels, said system comprising

a transducer array comprising n rows of hydrophones equally spaced around the longitudinal axis of said antenna;

a multiplexing means, having n inputs and one output, connected to said hydrophones, each hydrophone being connected to one input of said multiplexing means, said multiplexing means including address storage means associated therewith for selecting individual ones of said inputs, in succession, to appear at said output;

a demultiplexing means with one input and n outputs, said one input of said demultiplexing means being connected to said output of said multiplexing means and said demultiplexing means including address storage means associated therewith for directing said input of said demultiplexing means to each of said n outputs, one at a time, in succession, said address storage means of said multiplexing means and said demultiplexing means being connected to a first source of pulse trains each containing



synchronizing pulses for synchronizing the operation of both said address storage means;

a second pulse source of *r* pulses, connected to said multiplexing means so as to cause said multiplexing means to step the operation of said address storage means of said multiplexing means out of sychronism with said demultiplexing means; and

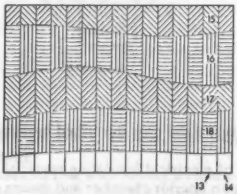
a time delay network, having one output and n inputs, for producing time delays corresponding to the relative distance a plane wave of sound echoes, traversing said transducer array, would travel between said hydrophones, said n inputs of said time delay network each being connected to at least one output of said demultiplexing means and said output of said time delay network forming the output of said system.

3,946,356

SYNTHETIC DISPLAY OF SEISMIC REFLECTION STRENGTH

Nigel A. Anstey, Sevenoaks, England, assignor to Seiscom Delta Inc.

Filed Feb. 22, 1974, Ser. No. 444,749
Int. Cl.² G01V *1/00*
U.S. Cl. 340—15.5 SS **17 Claims**



1. A method of making a synthetic seismic section from seismic interval velocity characteristic of seismic signals in intervals between seismic horizons for analysis of an observed seismic time or depth section, comprising the steps of:

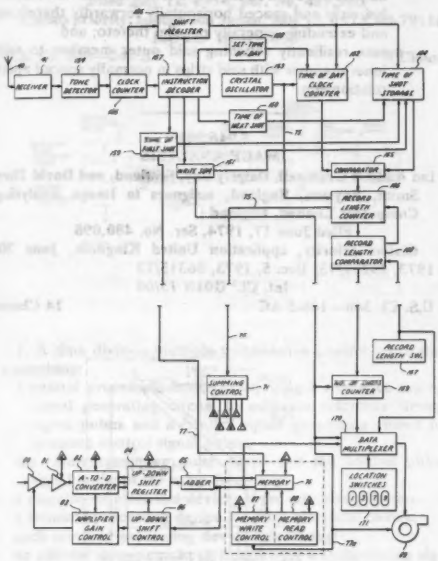
a. forming a synthetic representation of seismic signal strength for the seismic horizon by forming a ratio of the difference between interval velocities in intervals adjacent the seismic horizons to the sum of interval velocities in intervals adjacent the seismic horizons; and

b. displaying the synthetic representation of seismic signal strength for the horizons in the form of a seismic section.

3,946,357
METHOD AND APPARATUS FOR SEISMIC GEOPHYSICAL EXPLORATION

David Harold Weinstein, Brookshire; Monroe Alfred Ashworth, III, and A. J. Mallett, both of Houston, all of Tex., assignors to The Superior Oil Company, Houston, Tex.

Filed Dec. 23, 1974, Ser. No. 536,965
Int. Cl.² G01V 1/22; H04B 7/14
U.S. Cl. 340—15.5 TS **23 Claims**



1. A seismic system for geophysical exploration, comprising:

a seismic energy source for producing a shot which generates seismic waves through the earth;

a plurality of geophones, each of which senses the seismic waves after travel through the earth and generates an electrical signal representative thereof;

a plurality of geophone monitoring means, each geophone monitoring means being associated with and electrically coupled to at least one of the geophones; and

a control means for generating electrical signals initiating the operation of the various remotely located geophone monitoring means;

each of the remote geophone monitoring means including:

means for sampling the electrical signal generated by the associated geophone responsive to a shot of the seismic energy source and producing data representative thereof,

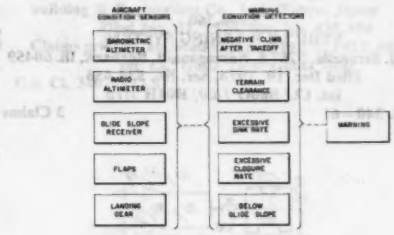
a memory means for storing the data accessed thereto, and

means for summing the data representative of the electrical signal generated by the associated geophone responsive to a particular shot of the seismic energy source, with the data, if any, representative of the electrical signal generated by the associated geophone responsive to a previous shot or shots, and for accessing such summed data to the memory means.

3,946,358
AIRCRAFT GROUND PROXIMITY WARNING INSTRUMENT

Charles Donald Bateman, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed June 19, 1974, Ser. No. 480,727
Int. Cl.² G08G 5/02
U.S. Cl. 340—27 R **29 Claims**



1. In an aircraft instrument for providing information based on the glide slope radio beam at an airport, the beam having a desired pattern along the intended glide path, providing valid fly up and fly down information and having undesired but unavoidable patterns along other paths providing spurious fly up and fly down information, the aircraft including means for receiving the glide slope radio beam, said receiving means having a glide slope output signal including both the valid and the spurious fly up and fly down information, a glide slope validity detector comprising:

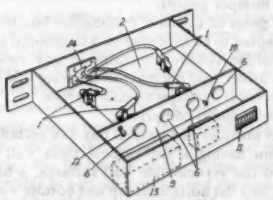
means responsive to the glide slope output signal for generating a signal which represents spurious fly up and fly down information; and

means responsive to the signal which represents spurious fly up and fly down information to inhibit utilization of the glide slope output signal upon occurrence of a spurious information signal which is in excess of a predetermined level.

3,946,359
MOTOR VEHICLE SAFETY AND/OR WARNING DEVICES

Henning Morgan Henderson, Flat 708 Monarch Mansions, 36 Twist St., Joubert Park, Johannesburg, Transvaal Province, South Africa

Filed Aug. 28, 1974, Ser. No. 501,232
Claims priority, application South Africa, May 13, 1974, 74/3034
Int. Cl.² B60Q 1/44
U.S. Cl. 340—52 H **11 Claims**



1. Apparatus for indicating excessive accelerative, decelerative and centrifugal forces acting on a moving vehicle, comprising:

at least one switch means;

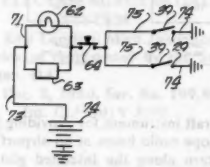
means mounting said switch means on a base member for movement from an open to a closed position upon application of an excessive inertial force to said base member; and

circuit means coupled to said switch means for indicating and recording when said switch means is in the closed position, said circuit means including time delay means for delaying the activation of said circuit means to indicate and record said closed position until said switch means has remained closed for a period of time from about 0.1 to about 0.5 second.

3,946,360
VEHICLE WARNING SYSTEM

Daniel J. Serritella, 7757 S. Narragansett, Burbank, Ill. 60459

Filed Dec. 19, 1974, Ser. No. 534,458
Int. Cl.² B60Q *1/00*; H01H *3/16*
U.S. Cl. 340—61 **3 Claims**



1. A vehicle warning system intended to be mounted to the front and back bumpers of a vehicle to warn the vehicle driver of the bumpers encountering an obstacle, the system comprising, in combination:

at least one pair of bumper guard members each of an identical structure and adapted to be mounted on the front and back bumpers respectively of the vehicle and project outwardly thereof forwardly of the bumper on which it is mounted;

pressure sensitive electrical contact means mounted in each of said bumper guards and being of a normally open electrical configuration adapted to be closed upon the engagement of said bumper guard with an obstacle;

a source of electrical energy;

an electric lamp;

an electrically operated buzzer;

electrical wiring means connecting said lamp in parallel relationship with said buzzer for simultaneous operation thereof;

an electrical switch manually operable between an on and an off position for selectively energizing and de-energizing said warning system, said switch being electrically wired intermediate said source of electrical energy and said parallelly connected lamp and buzzer; and

suitably insulated electrical wires interconnecting said switch, lamp and buzzer to said electrical contact means of said bumper guards;

a control panel of a hollow rectangular box-like configuration adapted to be mounted on a dashboard of the vehicle in a position readily accessible to and viewable by the vehicle driver, said control panel having said lamp, buzzer and electrical switch mounted therein;

each bumper guard comprising;

an inner member of a general box-like rectangular configuration having a flat vertical front wall surface, opposed flat vertical side wall surfaces, a back wall surface, and flat horizontal top and bottom wall surfaces;

means adapted to mount said inner member in vertical disposition relative to a horizontal vehicle bumper on said bumper with said inner member back surface engaging said bumper and with said inner member extending both forwardly and upwardly and downwardly from said bumper;

a slot extending vertically through said front surface of said inner member;

a metallic electrical conducting strip of an elongated rectangular configuration affixed in said slot and having a flat face surface projecting slightly forwardly of said inner member front surface;

an outer member of a box-like rectangular configuration having a flat vertical front surface, a flat vertical back surface, opposed flat vertical side wall surfaces, and opposed horizontal flat top and bottom surfaces;

a box-shaped rectangular recess formed inwardly of said side wall surfaces opening out of said back wall surface, said recess being of a width, depth, and height to freely receive a major portion of said inner member therein;

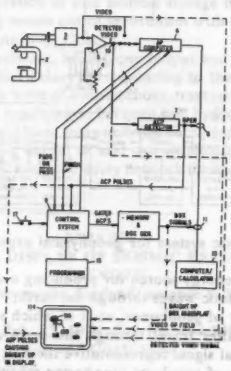
a metallic electrical conducting rectangularly shaped strip affixed to an interior front wall of said recess and disposed in confronting alignment with said inner member strip and spaced horizontally forwardly therefrom and extending generally parallel thereto; and

means resiliently retaining said outer member to said inner member with said strips in normally spaced apart relationship.

3,946,361
IMAGE ANALYSIS

Ian Andrew Cruttwell, Dalgety Bay, Scotland, and David Theo Smith, Royston, England, assignors to Image Analysing Computers Limited, England

Filed June 17, 1974, Ser. No. 480,098
Claims priority, application United Kingdom, June 20, 1973, 29237/73; Dec. 5, 1973, 56315/73
Int. Cl.² G01N *15/00*
U.S. Cl. 340—146.3 AC **14 Claims**



1. A method of analysing a field containing features and comprising the steps of scanning the field, generating a video signal corresponding to the field, comparing the video signal amplitude with at least one reference voltage to obtain constant amplitude detected signal pulses, generating from the detected signal pulses relating to each feature an ACP signal therefore after the last detected pulse for the feature, computing a value signal in a computing circuit relating to a parameter of the feature from the detected signal pulses which relate thereto and employing the ACP signal for the feature to release the value signal therefor, in which the further steps are provided of:

— storing in a first store electrical signals identifying the position of the first ACP signal to occur during an initial frame scan,

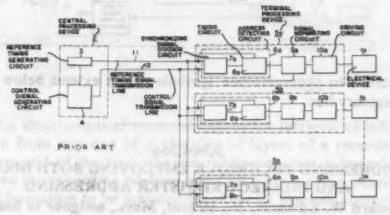
— employing the stored signals during a succeeding frame scan to select and store the value signal which is released by the first ACP signal,
— clearing the first store and inserting therein signals identifying the position of the next ACP signal to occur during scanning the field, and
— repeating the sequence of steps to obtain the corresponding value signals for each of the remaining features whose ACP signals are in turn identified.

3,946,362

TIME DIVISION MULTIPLE TRANSMISSION CONTROL APPARATUS

Shizuo Sumida; Kazuo Nii, both of Hiroshima; Hisatsugu Ito, Himeji; Atsushi Ueda, Himeji, and Mitsuaki Ishii, Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo and Toyo Kogyo Co., Ltd., both of, Japan

Filed July 12, 1974, Ser. No. 487,980
Claims priority, application Japan, July 13, 1973, 48-79116
Int. Cl.[2] H04Q 9/00
U.S. Cl. 340—147 SY **5 Claims**



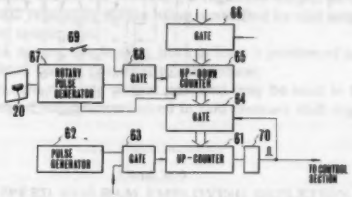
1. A time division multiple transmission control apparatus comprising:
a central processing device comprising a reference timing signal generating circuit to generate reference timing signal pulses and a control signal generating circuit to generate control signal pulses,
the reference timing pulse signal and the control pulse signal being of the same frequency,
a plurality of electrical devices to be selectively driven,
a terminal processing device for each electrical device,
each terminal processing device comprising:
an address detecting circuit comprising a sychronizing signal division circuit and a timing circuit for generating an address signal pulse,
a signal separating circuit for generating a driving signal pulse,
a driving circuit,
means connecting the synchronizing signal division circuit to the timing circuit,
means connecting the timing circuit to the signal separating circuit,
means connecting the signal separating circuit to the driving circuit,
means connecting the driving circuit to the electrical device,
means connecting the reference timing signal generating circuit to the control signal generating circuit,
a reference timing signal transmission line connected between the reference timing signal generating circuit and each of the synchronizing signal division circuits as well as each of the timing circuits,
a control signal transmission line connected between the control signal generating circuit and each of the synchronizing signal division circuits as well as each of the signal separating circuits,
means for delaying the control signal pulses with respect to the reference timing signal pulse to generate a phase difference therebetween so that an address signal pulse with a rising and/or falling delay time appearing at the output of a timing circuit in one of the terminal processing devices will not overlap a subsequent control signal pulse causing generation of an undesirable driving signal pulse at the output of the signal separating circuit in the terminal processing device.

3,946,363

VARIABLE TIME AXIS CONTROLLER IN SIMULATION COMPUTER

Hiroshi Hakozaki, Fujisawa, Japan, assignor to Mitsui Shipbuilding & Engineering Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1974, Ser. No. 438,394
Claims priority, application Japan, Feb. 6, 1973, 48-14225
Int. Cl.[2] G06F 1/04; G06G 7/00
U.S. Cl. 340—172.5 **1 Claim**



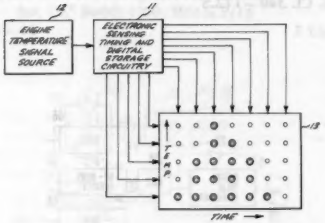
1. A time axis controller for use in a simulator of the type wherein said simulator comrises a programmable mini-computer capable of performing a predetermined simulation program stored therein and having a control section and a time axis controller connected thereto for additionally controlling the timing of programmed processing operations of said mini-computer, and a communication device connected to said mini-computer for visually providing the results obtained while performing a simulation program, the improvements wherein said time axis controller comprises a fixed frequency pulse generator for supplying pulses of predetermined period, an up-counter of preset type for counting said pulses from said pulse generator, a monostable multivibrator having its input connected to the output of said up-counter and having its output connected as an input to the control section of the mini-computer, a gate circuit having a first input connected respectively to the output from said monostable multivibrator and having its output connected to the setting input of said up-counter, an up-down counter having its output connected to a second input of said gate circuit and having a first input connected to a source of control pulses supplied from said mini-computer, said control pulses comprising the data for determining a programmed simulation operation, a variable pulse generator connected to a second input of said up-down counter and including manually operated means for varying the frequency of the pulses generated by the variable pulse generator, and means for enabling said up-down counter to be additionally controlled manually whereby upon said manually operated means being operated, the variable frequency pulses supplied by said variable pulse generator to said up-down counter varies the frequency of the pulses supplied by said up-down counter to said up-counter and the frequency of the pulses supplied by said up-counter to said monostable multivibrator to thereby vary the frequency of the pulses supplied by said monostable multivibrator to the control section of said mini-computer for controlling the timing of programmed simulation processing operations of the mini-computer.

3,946,364

METHOD AND APPARATUS FOR SENSING, STORING, AND GRAPHICALLY DISPLAYING OVER-TEMPERATURE CONDITIONS OF JET ENGINES

Joseph Codomo, Bellevue, and Eric K. Thorson, Snohomish, both of Wash., assignors to Eldec Corporation, Lynnwood, Wash.

Filed Jan. 8, 1975, Ser. No. 539,393
Int. Cl.² G06F *1/00*; G01K *13/00*
U.S. Cl. 340—172.5 13 Claims



1. Apparatus for receiving an electrical signal representing a temperature condition of a jet engine and sensing, storing, and displaying an over-temperature event incurred by such engine, comprising:

an analog to digital converter means adapted to receive said electrical temperature signal and convert it to a digital temperature signal;

over-temperature sensing means responsive to said temperature signal and having an electrical output indicating that said engine has commenced an over-temperature event;

digital storage means;

electrically energized, light emitting, solid state matrix display means; and

time base generator means connected and responsive to said electrical output of said over-temperature sensing means and connected to and for conditioning said storage means to store said temperature signal at each of a plurality of time intervals in response to said over-temperature sensing means indicating the commencement of said over-temperature event, and said display means connected to said storage means and to said time base generator means for graphically displaying said stored temperature signals as a function of time.

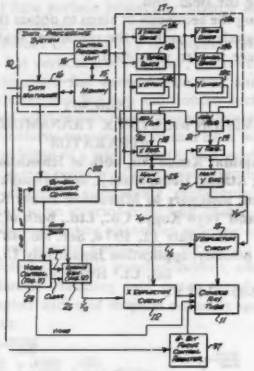
3,946,365

GRAPHIC SYMBOL GENERATOR

John A. Bantner, Los Angeles, Calif.

Filed Dec. 13, 1973, Ser. No. 424,220
Int. Cl.² G06F *15/20*, *3/14*; B41B *19/14*
U.S. Cl. 340—172.5 16 Claims

1. In apparatus for displaying graphic symbols on an imaginary line on the face of a cathode-ray tube and employing a beam control system, an improvement comprising means operative on said beam control system for starting each of a plurality of parallel strokes required for each symbol on said line, and means operative on said starting means for programming an offset below said imaginary line along which spaced symbols are displayed in sequence for each stroke of a symbol



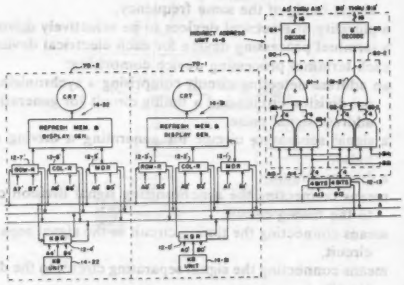
in order to accommodate symbols which extend below said imaginary line.

3,946,366

ADDRESSING TECHNIQUE EMPLOYING BOTH DIRECT AND INDIRECT REGISTER ADDRESSING

Howard W. Edwards, Jr., Dracut, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Continuation of Ser. No. 326,623, Jan. 26, 1973, abandoned, which is a division of Ser. No. 155,068, April 17, 1973, Pat. No. 3,728,689. This application Sept. 16, 1974, Ser. No. 506,088
Int. Cl.² G06F *13/00*
U.S. Cl. 340—172.5 4 Claims



1. In a buss type processor in which a direct address generator generates a pair of direct addresses for addressing one of a first plurality of registers in response to an address field contained within the processor instruction set; the improvement comprising

a second plurality of registers each accessed by a pair of indirect addresses,

first and second multiplexers jointly responsive to the contents of said one of said first plurality of registers and to said pair of direct addresses to select a portion of the contents of said one of said first plurality of registers, and

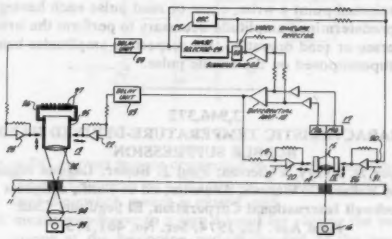
first and second decoders jointly responsive to said portion of the contents of said one of said first plurality of registers selected by said first and second multiplexers to

generate a pair of indirect addresses to address one of said second plurality of registers.

3,946,367
THREE DIMENSIONAL ELECTRO-OPTICAL RETRIEVAL SYSTEM

Peter G. Wohlmut, Palo Alto, and Frank D. Neu, Castro Valley, both of Calif., assignors to Videonics of Hawaii, Inc., Honolulu, Hawaii

Continuation-in-part of Ser. No. 316,661, Dec. 20, 1972. This application May 22, 1974, Ser. No. 472,080
Int. Cl.² G11C *13/04*
U.S. Cl. 340—173 LM **19 Claims**



1. An electro-optical retrieval system for retrieval of information from any one of a plurality of layers of a recording medium and of the type wherein relative motion is imparted between the recording medium and pick-up means for causing said information to be scanned for retrieval thereof, comprising

means for receiving an information containing multi-layered recording medium, said recording medium having at least two adjacent layers each of which comprises an optically transparent substrate and optically readable data thereon in the form of a data track and a surrounding area, and

electro-optical pick-up means for retrieving information selectively from any one of said layers, said electro-optical means including

light source means exterior to said recording medium for flooding with light the general area of interest of at least two adjacent layers of said multi-layered recording medium,

detector means and lens means for focusing an image of an area of a selected layer of said recording medium onto said detector means, the image so focused comprising a portion of the data track and surrounding area of the selected layer, said lens means having a short focal length providing a depth of field less than the thickness of two adjacent substrates to enable focusing of the data track between adjacent substrates of said recording medium, and

control means for causing said focusing of the data track from a selected layer of said recording medium through said lens means onto said detector means.

3,946,368
SYSTEM FOR COMPENSATING VOLTAGE FOR A CCD SENSING CIRCUIT

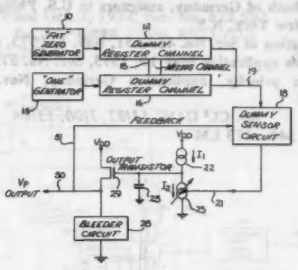
Sunlin Chou, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 27, 1974, Ser. No. 536,797
Int. Cl.² G11C *11/40, 19/00*; H03K *17/60*
U.S. Cl. 340—173 R **15 Claims**

1. An apparatus for providing a regulated potential in an MOS-CCD memory which includes a plurality of charge-coupled memory shift registers for storing information comprising:

a pulse supply means including a charge-coupled shift register for generating a register reference output signal;

a sensor having an output and an input coupled to said register output signal for sensing said register reference output signal;



a regulating means for providing a regulated output potential, said regulating means being controlled by said output of said sensor; and

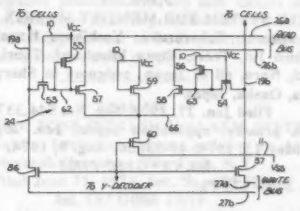
feedback means, for feeding back at least a portion of said regulated output potential to said sensor;

whereby said regulatd output potential may be used in the sensing of information stored in said memory shift registers.

3,946,369
HIGH SPEED MOS RAM EMPLOYING DEPLETION LOADS

Richard D. Pashley, Mountain View, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Apr. 21, 1975, Ser. No. 569,693
Int. Cl.² G11C *7/06*
U.S. Cl. 340—173 R **14 Claims**



1. In an MOS RAM employing at least one column line which is coupled to a memory cell and which communicates with a read line, an improvement comprising:

a first MOS transistor coupled to said column line for charging said column line to a first potential;

a second MOS transistor having a first and a second terminal and a gate, said first terminal being coupled to said column line and said gate being coupled to a source of a second potential, the difference between said first and second potential being approximately equal to the threshold voltage of said second transistor; and

a third MOS transistor for charging said second terminal of said second transistor to said second potential, coupled to said second terminal of said second transistor;

whereby as the potential on said column line changes said second transistor conducts between said first and second terminals changing the potential on said second terminal of said second transistor, which charged potential may be coupled to a read line.

3,946,370

METHOD OF MAKING LIGHT-DOT DISTRIBUTION FOR THE HOLOGRAPHIC STORAGE OF BINARY INFORMATION WITH THE AID OF ELECTRONICALLY CONTROLLED SWITCHING MASKS

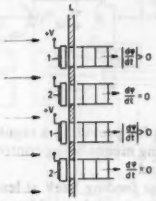
Klaus Peter Schmidt, Quickborn, and Bernhard Hill, Hamburg, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 411,651, Nov. 1, 1973, abandoned. This application May 19, 1975, Ser. No. 578,613

Claims priority, application Germany, Nov. 2, 1972, 2253626

Int. Cl.[2] G11C *11/22, 7/00, 13/04*

U.S. Cl. 340—173 LM 3 Claims



1. Apparatus for making light dot distributions for the holographic storage of binary information comprising a holographic recording medium, a transparent mask having a temperature dependent refractive index, a plurality of heat emitting electronically controlled electrodes on said mask for selectively heating portions of said mask, whereby radiation passing through the mask is phase modulated by those portions of the mask thermally activated by the electrodes, the holographic storage medium being arranged in the path of the radiation passing through the mask, and means for selectively providing electronic signals to said electrodes.

3,946,371

DRIVE SYSTEM FOR MEMORY MATRIX PANEL

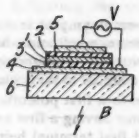
Kenzoo Inazaki, Takarazuka; Yoshiharu Kanatani, Tenri; Masahiro Ise, Tenri; Etsuo Mizukami, Tenri, and Chuji Suzuki, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 27, 1975, Ser. No. 544,337

Claims priority, application Japan, Jan. 25, 1974, 49-11274; May 13, 1974, 49-53636; Aug. 9, 1974, 49-91812

Int. Cl.[2] G11C *11/28*

U.S. Cl. 340—173 PL 1 Claim



1. In a drive method for a memory matrix panel which comprises a light-emitting body having hysteresis behavior responsive to application of a desired AC voltage, a plurality of horizontal electrodes disposed on a first major surface of the light-emitting body and a plurality of vertical electrodes disposed on a second major surface of the light-emitting body, each cross point of the both electrodes providing a light-emitting unit point in a matrix array, wherein a period of the applied AC voltage includes at least three sections, said method comprising:

applying a horizontal maintenance pulse having an amplitude necessary to maintain light emission to the plurality of horizontal electrodes during the first section of the AC voltage period prior to the writing, erasing or reading of information;

applying a vertical maintenance pulse having an amplitude necessary to maintain light emission to the vertical electrodes during the second section of the AC voltage period prior to the writing, erasing or reading of information;

applying an enable pulse having the shape identical with that of the horizontal maintenance pulse but the phase shifted into the third section of the AC voltage period to the vertical electrode asociated with a selected point to perform the writing, erasing or reading of information on such selected point; and

applying to the horizontal electrode associated with such selected point a write, erase or read pulse each having a predetermined amplitude necessary to perform the write, erase or read operation, the respective amplitudes being superimposed on the enable pulse.

3,946,372

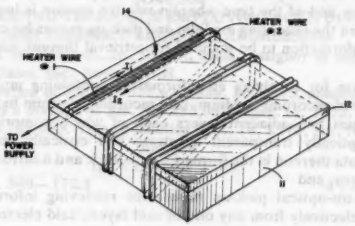
CHARACTERISTIC TEMPERATURE-DERIVED HARD BUBBLE SUPPRESSION

Rodney D. Henry, Fullerton; Paul J. Besser, Laguna Niguel, and Robert G. Warren, Anaheim, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 15, 1974, Ser. No. 461,173

Int. Cl.[2] G11C *11/14*

U.S. Cl. 340—174 TF 3 Claims



1. A stratified magnetic composite for selectivity generating single wall magnetic domains, comprising:

a monocrystalline garnet substrate;

a monocrystalline layer of magnetic garnet materials supported by said substrate and having such a garnet composition that only normal single wall magnetic domains can be formed therein above a critical tempertaure, the composition of said layer being substantially uniform throughout the thickness of said layer; and

means for maintaining the temperature of said layer at a temperature above said critical temperature and below the Neel temperature of said layer.

3,946,373

CONTROL CIRCUIT FOR A ROTATING MAGNETIC FIELD OF A BUBBLE MEMORY

Rob Mookenbeek, Burlington, and Bent Norlund, Sudbury, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sept. 9, 1974, Ser. No. 504,203

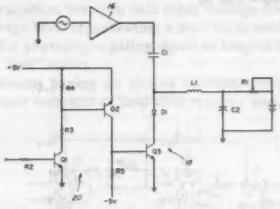
Int. Cl.[2] G11C *11/14*

U.S. Cl. 340—174 TF 9 Claims

1. In a circuit for propagating domains in a field accessed, cylindrical magnetic domain memory of the type having a pair of coils disposed perpendicular to each other and around a region occupied by the memory, a pair of AC current sources for supplying AC current to the coils, the currents from the sources being in quadrature phase to provide a rotating mag-

netic field in the plane of the memory and a capacitor associated with each coil to form a resonant circuit at the frequency of the AC current, an improvement comprising:

a. a switch means connected to one terminal of the coil and to a return path for the AC current source to shunt the AC current away from the coil whenever the switch means is closed, the switch remaining open during an operate mode in which the coil is driven by the AC current,



b. a DC current source connected to the other terminal of the coil for supplying a DC current through the coil whenever the switch means is closed, and

c. means responsive to a signal input for closing the switch means at the beginning and at the end of the operate mode for shunting the AC current away from the coil and for forming a path for the flow of DC current through the coil to reduce the risk of losing coherent storage of data in the memory, the switch means preventing the AC current from flowing simultaneously through the switch and the coil so that the switch does not introduce distortion in the rotating magnetic field.

3,946,374

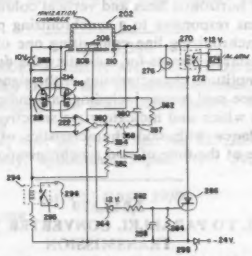
RATE-OF-CHANGE COMBUSTION AND CONTAMINATION DETECTION DEVICE

Lonnie S. McMillian, and George E. Frohwein, both of Huntsville, Ala., assignors to SCI Systems, Inc., Huntsville, Ala.

Division of Ser. No. 63,646, Aug. 13, 1970, Pat. No. 3,798,625, which is a continuation-in-part of Ser. No. 7,444, Jan. 2, 1970, abandoned. This application Dec. 13, 1973, Ser. No. 424,305

Int. Cl.² G08B *17/10*; H01J *39/28*

U.S. Cl. 340—237 S **11 Claims**



1. Gas contamination detector apparatus comprising an ionization chamber readily accessible to the gas under test, means for ionizing the gas in said chamber, means for conducting an electrical current through said chamber, amplification means for producing an output signal which is a function of said current, level detector means for detecting a pre-determined signal level at the output of said amplification means, and bandpass filter means for attenuating the gain of said amplification means with respect to very slow and very rapid changes in said current.

3,946,375

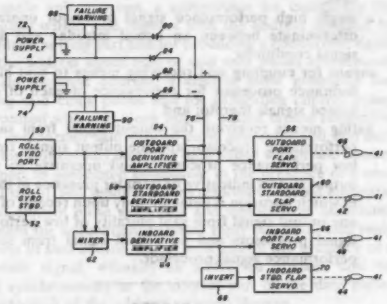
REDUNDANT DC POWER SUPPLY FOR ANALOG COMPUTERS AND THE LIKE

Marion M. Bishop, Seattle, and Walter Robert Weist, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 7, 1974, Ser. No. 512,503

Int. Cl.² G08B *21/00*; H02J *1/10*

U.S. Cl. 340—253 C **3 Claims**



1. A power supply system for operational amplifiers and other circuit components utilized in a control system employing a plurality of signal channels, comprising a first separate direct current power supply, a second separate direct current power supply, both of said power supplies having a terminal which is positive with respect to a point of common potential and a terminal which is negative with respect to the same point of common potential, diodes poled to conduct current in one direction connecting said positive terminals to terminals in all of said channels adapted for connection to a source of positive potential, and the diodes poled to conduct current in the opposite direction connecting said negative terminals to terminals in all of said channels adapted for connection to a source of negative potential whereby said diodes are connected in such a manner so as to prevent a short in one power supply from draining current of both positive and negative potential from another power supply.

3,946,376

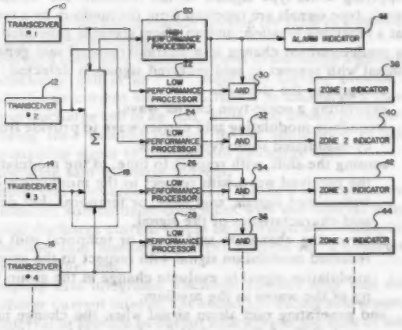
MULTIPLE ZONE INTRUSION ALARM SYSTEM

Aaron A. Galvin, Lexington, Mass., assignor to American District Telegraph Company, New York, N.Y.

Filed June 11, 1974, Ser. No. 478,370

Int. Cl.² G08B *13/16*

U.S. Cl. 340—258 R **6 Claims**



1. A multiple zone intrusion alarm system comprising:

a plurality of transmitting and receiving means each disposed in a respective zone under surveillance and each including means for propagating a signal in said zone and means for receiving signals returned from said zone and from objects therein;

a plurality of low performance signal processors each coupled to a corresponding one of said receiving means for receipt of returned signals therefrom and for providing in response to said returned signals an output signal representative of possible intruder presence in a corresponding zone;

a single high performance signal processor operative to discriminate between an actual intruder and spurious signal conditions;

means for coupling said receiving means to said high performance processor for conveyance of each of said returned signals thereto; and

gating means receiving the output signal from said high performance processor and the output signals from said low performance processors and operative to provide output signals indicative of intruder presence in the zones in which intrusion is detected only upon receipt of at least one output signal from said plurality of low performance signal processors and an output signal from said high performance signal processor.

3,946,377
METHOD AND APPARATUS TO MONITOR CONDUCTION OF SONIC WAVES IN AN ACOUSTICALLY CONDUCTIVE MEDIUM

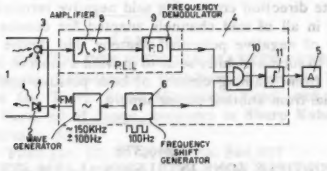
Alois Zetting, Herrliberg, Switzerland, assignor to Cerberus AG, Mannedorf, Switzerland

Filed June 21, 1974, Ser. No. 481,818

Claims priority, application Switzerland, July 10, 1973, 10024/73

Int. Cl.² G08B *13/08*

U.S. Cl. 340—274 R **30 Claims**



1. Method of monitoring conduction of sonic-type waves in an acoustically conductive medium, in which wave-type signals are generated; the generated wave-type signals are applied to the medium at a transmitting location by a transmitter applying sonic-type signals to the medium; the transmitted sonic-type signals are received from the medium by a receiver at a receiving location; and an alarm signal is generated when a predetermined change in a characteristic of said generated signal with respect to said received signals is detected;

comprising the steps of:

generating a sonic-type carrier wave;

frequency-modulating said carrier wave to provide frequency-modulated sonic-type signals;

sensing the shift, with respect to time, of the modulation of the received wave with respect to the modulation of the transmitted signals, said time, or temporal shift defining said characteristics of the signal;

determining change in said time, or temporal shift of the received modulation signal with respect to the generated modulation signal to evaluate change in the group velocity of the waves in the medium;

and generating said alarm signal when the change in temporal shift of the modulation between transmitted and received signals exceeds a predetermined value.

3,946,378
DYNAMIC DIGITAL PULSE DISPLAY

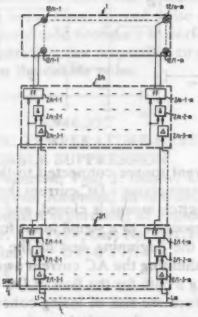
Günter Hahn, Boeblingen; Hans Hermann Lampe, Herrenberg, and Peter Rudolph, Schoenaich, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 18, 1974, Ser. No. 515,950

Claims priority, application Germany, Nov. 9, 1973, 2355994

Int. Cl.² G08B *5/36*

U.S. Cl. 340—324 M **8 Claims**



1. An arrangement for the dynamic digital display of predetermined characteristics of a high frequency pulse train wherein a pulse sequence is applied to an equidistantly tapped delay line, comprising in combination

a plurality of sets of bistable circuits, logic AND gates and amplifiers, the taps of said delay line being connected to the input of the associated amplifiers of all said sets, wherein the amplitude range of said pulse sequence is divisible into adjacent amplitude intervals whereby the amplifier of each of said sets generates an output signal only when an input of a predetermined level is provided from said delay line, a matrix of display indicators, said matrix of display indicators being arranged in a configuration of horizontal lines and vertical columns,

and means responsive to a synchronizing pulse applied to the synchronizing line comprising one of said inputs to said bistable circuits for indicating the duration, spacing and amplitude characteristics of the signals in said pulse sequence said means including said indicator configuration in which said indicators are selectively energized in accordance with said characteristics of said pulse sequence at the time of said synchronization pulse.

3,946,379
SERIAL TO PARALLEL CONVERTER FOR DATA TRANSMISSION

Michael David Lippman, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 31, 1974, Ser. No. 475,129

Int. Cl.² G06F *5/04*

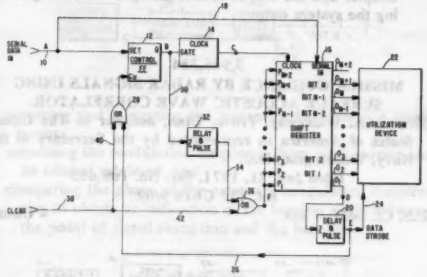
U.S. Cl. 340—347 DD **1 Claim**

1. A circuit for converting a serial input data stream into blocks of parallel output data, said serial input data stream comprising a plurality of characters, each character comprising N bits of digital information preceded by a start bit represented by one voltage level and followed by at least one stop bit represented by another voltage level, said circuit comprising:

a shift register having a clock input terminal, and having a data input terminal receptive to said serial input data stream, and comprising N+X stages, where X equals the number of start and stop bits preceding and following, respectively, each character, each stage having an output terminal, said shift register being adapted through a reset terminal for having each of said N+X stages preset to a particular initial condition, said initial condition being represented by said other voltage level;

a set-reset flip-flop circuit having a set input terminal receptive to said serial input data stream and being responsive to the transition between said other voltage level and said one voltage level representing a start bit in said input data stream for providing a gating signal so long as the flip-flop is in its "set" state;

clocking means having an output terminal coupled to the clock input terminal of said shift register and responsive



to the presence of said gating signal for serially clocking in a start bit, N bits representing a character and said at least one stop bit into said shift register;

pulse means coupled to the output terminal of a particular stage of said shift register and responsive to the transition from the initial condition voltage level to the voltage level representing said start bit in said particular stage for providing a strobing signal indicating the availability of a complete character at N output terminals of said shift register;

means coupling said strobing signal to the reset input of said flip-flop to thereby discontinue said gating signal and the output of said clocking means; and

delay means responsive to termination of said gating signal for coupling a signal to the reset input terminal of said shift register to restore the shift register to said initial condition.

3,946,380

REMOTE SUPERVISION AND CONTROL SYSTEM

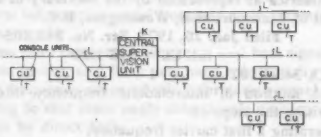
Kazuaki Ohnishi, Osaka, and Katsuhiro Ohnuki, Sakai, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Nov. 26, 1974, Ser. No. 527,209

Claims priority, application Japan, Nov. 30, 1973, 48-136355

Int. Cl.² G08B 29/00

U.S. Cl. 340—409 **14 Claims**



1. A system for supervising and controlling remote equipment comprising in combination, a central supervision unit, a plurality of console units associated with the respective equipment to be controlled and supervised, a clock pulse line, a data pulse line, a reply pulse line, said lines coupling said supervision unit to said console units; said central supervision unit including means for sending out a series of clock pulses on said clock pulse line, means for sending out a series of data pulses on said data pulse line, said data pulses including an address signal part and a control signal part, each of said parts including a plurality of data pulses, and means for receiving a series of reply pulses from said reply pulse line; each of said console units comprising a shift register for storing data pulses, an address setting part in which an address assigned to the console unit is preset, a comparator for comparing the data pulses within said register with the address assigned by said address setting part and for producing a concurrent signal when the address signal part of said data pulses corresponds with said assigned address, a control pulse generator for counting said clock pulses and for generating control pulses synchronized with said clock pulses, output means responsive to said comparator said control pulse generator and said data pulses for sequentially directing data pulses within said control signal part to associated equipment in the presence of a concurrent signal, and sending means responsive to said comparator said control pulse generator and signals from associated equipment for sequentially sending reply pulses on said reply pulse line to said central supervision unit in the presence of a concurrent signal, whereby an addressed console unit responds synchronously to the control part of the data pulses after detection of the address assigned thereto.

3,946,381

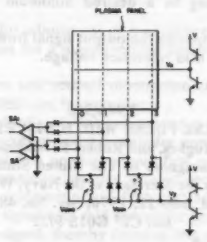
GRAPHIC SYSTEM APPARATUS UTILIZING PLASMA DISPLAY/MEMORY DEVICES WITH DIRECT ELECTRICAL READ-OUT

Roger L. Johnson, Monticello, and Larry F. Weber, Urbana, both of Ill., assignors to National Science Foundation, Washington, D.C.

Continuation-in-part of Ser. No. 259,989, June 5, 1972, abandoned. This application May 14, 1973, Ser. No. 359,638

Int. Cl.² G11C 11/28

U.S. Cl. 340—173 R **49 Claims**



1. A method for electronically sensing the state of a gaseous discharge cell comprising:

applying a sustaining signal sufficient to discharge a gaseous discharge cell in an "on" state and thereby provide a discharge current but not sufficient to discharge a gaseous discharge cell in an "off" state, said discharge current being time delayed relative to the application of said sustaining signal to said gaseous discharge cell;

integrating said discharge current;

sensing said discharge current only during a sensing interval initiated substantially coincident with the interval when said discharge current would be provided and continuing beyond said discharge current interval for a predetermined time; and

sampling said integrated discharge current after said discharge current interval has ended but during said sensing interval to provide an output indicative of the state of said cell.

3,946,382

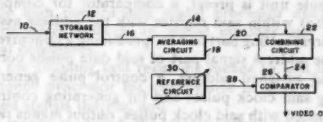
SEARCH RADAR ADAPTIVE VIDEO PROCESSOR

Alexander Kossiakoff, Brookville, and James R. Austin, Gaithersburg, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 12,541, Jan. 28, 1970, abandoned. This application Oct. 27, 1972, Ser. No. 302,609

Int. Cl.² G01S 7/30, 9/02

U.S. Cl. 343—5 DP **14 Claims**



1. An adaptive radar video processor for segregating clutter from target signals in radar returns composed of a plurality of range cells, said video processor comprising:

means for storing periodically updated video signals corresponding to each range cell in said radar returns,

a first means for gaining access to the stored video signal corresponding to a particular range cell of interest, said range cell of interest being defined as the center tap cell,

a second means for gaining access to the stored video signals corresponding to a plurality of range cells that surround said center tap cell,

averaging means for producing from the average value of said video signals corresponding to said surrounding range cells an average value signal representing the mean value of clutter amplitude in the vicinity of said center tap cell,

means for combining said center tap video signal with said signal representing said mean clutter value to produce an output signal corresponding to the instantaneous signal-to-clutter ratio,

a source of adjustable reference voltage, the amplitude of said reference voltage providing a false alarm threshold corresponding to a desired minimum signal-to-clutter ratio, and

means for comparing the output signal from said combining means with said reference voltage.

3,946,383

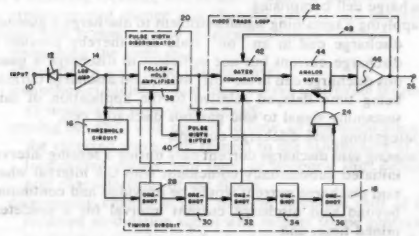
MONOPULSE PULSE WIDTH DISCRIMINATOR

Richard Smith Hughes, and Robert E. Atkinson, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 22, 1970, Ser. No. 48,785

Int. Cl.² G01S 9/22

U.S. Cl. 343—7 A **6 Claims**



1. An electronic system for differentiating between signals on the basis of pulse width and amplitude, comprising:

input means adapted to receive an input signal;

a logarithmic amplifier operatively connected to said input means and providing an output;

discriminator means operatively connected to the output of said logarithmic amplifier for discerning the pulse width of said input signal relative to a reference, and for providing outputs from a first and second coupler wherein said first coupler provides an output only when the pulse width of said input signal is greater than said reference;

timing means also operatively connected to the output of said logarithmic amplifier for providing timed signal outputs;

gating means operatively connected to said first coupler and said timing means for providing a signal output only when signals are simultaneously received from said first coupler and said timing means; and

a video track loop operatively connected to said second coupler and the output of said gating means, and providing the system output.

3,946,384

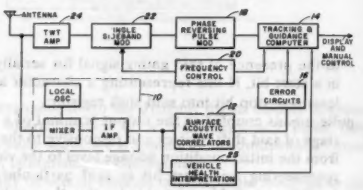
MISSILE GUIDANCE BY RADAR SIGNALS USING SURFACE ACOUSTIC WAVE CORRELATOR

Thomas A. Westaway, Provo, Utah, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 21, 1971, Ser. No. 108,653

Int. Cl.² G01S 9/02

U.S. Cl. 343—7 ED **4 Claims**



1. A remote control system for guiding a missile comprising:

a radar system including means for transmitting phase-coded command signals, one phase-coded signal for each command;

means installed in the missile for receiving said command signals;

means for decoding the command signal,

said decoding means comprising a plurality of surface-acoustic-wave correlators, one correlator for each command signal, and means for deciphering the output of the correlators to determine which of the correlators produced a response; and,

means for operating a control surface on the missile in response to the decoded command signal.

3,946,385

INTERFEROMETRIC NAVIGATION AND GUIDANCE SYSTEM

Harold I. Ewen, Weston, Mass., assignor to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed Jan. 20, 1975, Ser. No. 542,505

Int. Cl.² G01S 1/20

U.S. Cl. 343—102 **6 Claims**

1. A method of intermediate frequency interferometry comprising the steps of:

generating a first carrier frequency;

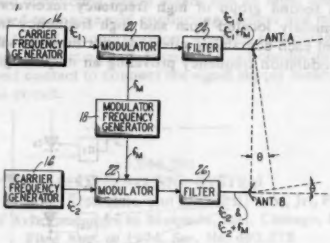
generating a second carrier frequency;

generating a modulation signal;

employing the modulation signal to generate a first sideband frequency relative to the first carrier frequency and a

second sideband frequency relative to the second carrier frequency, each sideband frequency having the same frequency and phase relationship relative to its carrier frequency;

transmitting the carrier frequencies and their related sideband frequencies from respective points located on a common baseline;



receiving and separating the transmitted signals at a single point;

extracting the modulation frequency from each carrier and its related sideband; and

comparing the phase of the extracted modulation frequencies to obtain an indication of the bearing angle between the point of signal reception and the baseline.

3,946,386
NAVIGATION RECEIVER WITH DOPPLER FILTER GATING

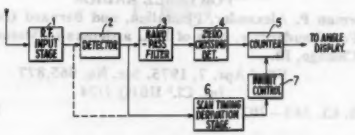
Francis G. Overbury, Cuffley, and Paul Barton, Bishop Stortford, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 18, 1974, Ser. No. 524,554

Claims priority, application United Kingdom, Nov. 27, 1973, 54970/73

Int. Cl.² G01S 1/44

U.S. Cl. 343—106 D **10 Claims**



1. In a Doppler type radio navigation receiving system arranged to be responsive to a radio beacon transmitting a main angle data signal produced through successively scanning by commutating a radio frequency source to the radiating elements of a linear array according to a predetermined switching directional program and a transmitted reference signal at a frequency offset from the frequency of said radio frequency source, said beacon being arranged to digitize the scan program of said array, the combination comprising:

first means within said receiving system for deriving a Doppler beat information signal from said main and reference beacon signals;

a bandpass filter connected to receive said beat signal from said first means, said filter pass band substantially covering the frequency range of said information signal corresponding to said main angle data signals arriving at said receiver by direct path;

frequency measurement means responsive to the output of said bandpass filter for determining the frequency of said beat signal;

synchronizing means responsive to at least one of said main and reference signals, generating a gating period for controlling the time of response of said frequency measurement means to produce an output therefrom for a time during each of said scan cycles which is less than the period of the full corresponding scan cycle.

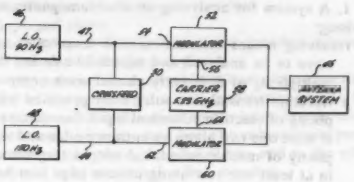
3,946,387
METHOD AND APPARATUS FOR ADJUSTMENT OF MODULATION COURSE PATTERNS IN A NAVIGATIONAL SYSTEM

Elliott H. Drucker, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 26, 1974, Ser. No. 500,541

Int. Cl.² G01S 1/14

U.S. Cl. 343—109 **8 Claims**



1. A method for adjustment of modulation course width in a guidance system for a maneuverable apparatus, comprising the steps of:

generating first and second modulation signals having respectively different frequencies;

separating each of said first and second modulation signals into a first portion and a remainder portion;

combining said first portion of said first modulation signal with said remainder portion of said second modulation signal, and combining said first portion of said second modulation signal with said remainder portion of said first modulation signal, thereby forming first and second composite modulation signals;

generating a carrier signal;

modulating said carrier signal with said first composite modulation signal to produce a first modulated carrier signal and modulating said carrier signal with said second composite modulation signal to produce a second modulated carrier signal; and,

transmitting said first and second modulated carrier signals into space such that they overlap one another, thereby defining a guidance path for maneuverable apparatus along a directional axis in space in which the summed signal levels of said portions of said first modulation signal equals the summed signal levels of said portions of said second modulation signal on said modulated carrier signals, and defining a course width for said maneuverable apparatus in which the difference between said summed signal levels of said portions of said first modulation signal and said summed signal levels of said portions of said second modulation signal on said modulated carrier signals is no greater than a predetermined magnitude.

3,946,388
SYSTEM FOR AND METHOD OF ANALYZING ELECTROMAGNETIC WAVES

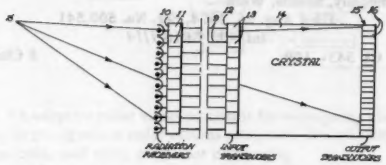
Jean Schifrine, Vaucresson, France, assignor to Electronique Marcel Dassault, Paris, France

Continuation-in-part of Ser. No. 79,744, Oct. 12, 1970, abandoned. This application Apr. 17, 1973, Ser. No. 352,081

Claims priority, application France, Oct. 13, 1969, 69.34986; Oct. 20, 1969, 69.35941

Int. Cl.² G01S 5/02

U.S. Cl. 343—113 R **15 Claims**



1. A system for analyzing an electromagnetic wave, comprising:

receiving means oriented toward a common source of a wave to be analyzed and adapted to derive therefrom a multiplicity of differently phased wave components;

a vibration-transmissive solid body provided with a multiplicity of electromechanical input transducers arrayed in at least one row along an entrance edge and with a multiplicity of mechanoelectrical output transducers arrayed in at least one row along an exit edge remote from said entrance edge; and

circuit means extending from said receiving means to said input transducers for substantially simultaneously energizing the latter with substantially the same frequency and with a phase relationship corresponding to that of said wave components, thereby mechanieally generating localized vibrations in said body giving rise at said exit edge to a resultant vibration predominantly exciting an output transducer whose location on said body is a function of said phase relationship.

3,946,389
CIRCUIT ARRANGEMENT FOR THE WIRELESS TRANSMISSION OF CONTROL SIGNALS TO THE CONTROL PATHS OF CONTROLLED SEMICONDUCTOR VALVES

Adolf Habock, Uttenreuth, Germany; Oskar Beckmann, St. Polten, Austria; Stefan Frese; Herbert Radda, both of Vienna, Austria; Franz Mayerhofer, Modling, Austria, and Karl-Friedrich Leowald, Weiher, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 5, 1974, Ser. No. 529,723

Claims priority, application Germany, Dec. 5, 1973, 2360662

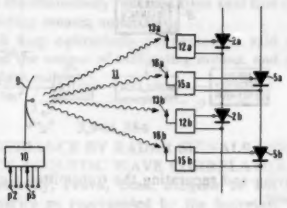
Int. Cl.² H03K 17/00

U.S. Cl. 343—225 **2 Claims**

1. A circuit arrangement for the wireless transmission of control signals to the control paths of controlled semiconductor vavles such as thyristors used in a rectifier for high voltage, said semiconductor valves including a first group of controlled semiconductor valves arranged for simultaneous firing in response to a first control signal and a second group of control semiconductor valves similarly arranged to be simultaneously fired by in response to a second control signal occurring at a time different from said first control signal with first and second intermediate frequency modulation frequencies associated respectively with said first and second control signals, a high frequency common to both groups being provided for transmitting a signal having a high frequency carrier modulated by said first and second intermediate frequency modulation frequencies in dependent on said first and second control signals comprising:

a. a first group of high frequency receivers disposed remotely from said high frequency transmitter each including a demodulator tuned to said first modulation frequency and providing an output to the control path of a semiconductor valve in said first group of controlled semiconductor valves;

b. a second group of high frequency receivers similarly remotely located from said high frequency transmitter and each containing a demodulator tuned to said second modulation frequency providing an output signal to the control path of a semiconductor valve from said second group of controlled semiconductor valves;



c. a high frequency transmitter including a transmitting antenna equipped with a reflector and means to train said reflector in the direction of said individual high frequency receivers, said high frequency transmitter being a frequency modulated high frequency transmitter having a carrier frequency in the range of 10 mhz to 50 ghz; and

d. wherein the demodulators in each of said high frequency receiver comprises a filter tuned to demodulate the frequency associated with its control signal and to substantially block the passage of other frequencies.

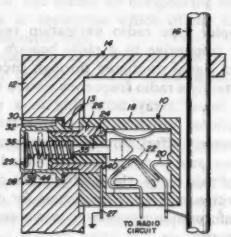
3,946,390
RADIO FREQUENCY CONNECTOR SYSTEM FOR PORTABLE RADIOS

Norman P. Alexander, Plantation, and Bernard Gasparaitis, Fort Lauderdale, both of Fla., assignors to Motorola, Inc., Chicago, Ill.

Filed Apr. 7, 1975, Ser. No. 565,877

Int. Cl.² H01Q 1/24

U.S. Cl. 343—702 **12 Claims**



1. An antenna connector structure for a portable radio having a self contained antenna, for selectively connecting the radio circuit to the antenna and to external signal supply means, including in combination:

a first contact connected to the antenna,

a second flexible contact connected to the radio circuit and normally in engagement with said first contact and capable of being flexed away from said first contact,

a conducting plunger biased to a first position spaced from said second contact and movable to a second position engaging said second contact and flexing the same away from said first contact,

annular conducting sleeve means spaced about said plunger, and

connector means connected to external signal supply means including an outer annular conductor adapted to couple to said conducting sleeve means and an inner conductor adapted to engage said conducting plunger and move the same to said second position, whereby said plunger provides a conducting path from said inner conductor to said second contact to connect the signal supply means to the radio circuit.

3,946,391
BUOY ANTENNA SYSTEM

Virgil A. Cuckler, Scottsdale, and Russell R. Yost, Jr., Phoenix, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Aug. 1, 1974, Ser. No. 493,578
Int. Cl.² H01Q 1/34
U.S. Cl. 343—709 **4 Claims**

1. A buoy antenna system comprising in combination:

molded dielectric housing means having a predetermined center of buoyancy whereby a first portion of said housing means rides above a water surface and a second portion thereof rides submerged;

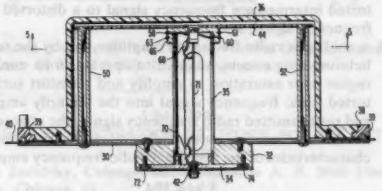
rigid antenna means mounted within said molded dielectric housing means for providing at least one function of a signal transmitting and receiving operation, said antenna means being disposed within said first portion of said molded dielectric housing means; conductive skirt means contiguously disposed within said molded dielectric housing means so that said conductive skirt means has a portion thereof which extends above said water surface with the remainder of said conductive skirt means extending below said water surface an odd multiple of quarter-wave lengths at the frequency of said transmitted signal, said conductive skirt means being attached to said antenna means; and

transmitter means disposed within said molded dielectric housing means for providing signals to be transmitted by said antenna means, said transmitter means being electrically coupled to said antenna means.

3,946,392
ELECTRICALLY SHORT TRANSMISSION LINE ANTENNA

Robert E. Whitman, Asbury Park, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 19, 1975, Ser. No. 551,187
Int. Cl.² H01Q 1/36
U.S. Cl. 343—830 **16 Claims**



1. An electrically short electromagnetic wave antenna comprising at least one section of shorted transmission line having a length less than a quarter wavelength of the operating frequency wherein the improvement comprises:

a metal ground plane;

a substantially vertical transmission line member terminating at one end in the ground plane;

a strip transmission line member mounted substantially parallel to the ground plane and terminating at one end in the other end of said vertical transmission line member;

a flexible transmission line member, also substantially parallel to the ground plane, coupled at one end to the other end of said strip transmission line member;

a rotatable spindle including an electrical conductive element coupled to the other end of said flexible transmission line member and being adapted to wind a predetermined portion of said flexible transmission line member thereon when rotated to vary the electrical length of the shorted transmission line formed by said above recited transmission line members;

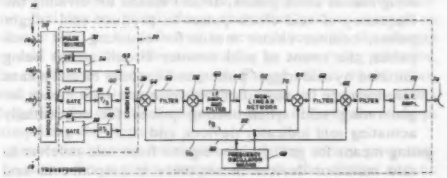
first and second series connected capacitor means respectively adapted to act as tuning means and impedance matching means, said first capacitor means having one side coupled to the electrical conductive element of said spindle and said second capacitor means having one side coupled to the ground plane; and

input means adapted to be coupled to radio apparatus coupled to the common connection between said first and second capacitor means.

3,946,393
TRANSPONDER FOR USE IN A RADIO FREQUENCY COMMUNICATION SYSTEM

Thomas P. Dunne, Acton, and Richard D. Ruggiero, Woburn, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 24, 1974, Ser. No. 436,254
Int. Cl.² G01S 9/56
U.S. Cl. 343—6.8 R **4 Claims**



1. In a radio frequency transponder wherein a received radio frequency signal is linearily amplified and then retrans-

mitted as a radio frequency signal, the improvement comprising:

a. first heterodyning means, responsive to the received radio frequency signal, for converting such signal to a corresponding intermediate frequency signal;

b. means, responsive to the amplitude of the intermediate frequency signal, for distorting such intermediate frequency signal in accordance with the amplitude of the intermediate frequency signal;

c. second heterodyning means, for converting such distorted intermediate frequency signal to a distorted radio frequency signal; and,

d. a nonlinear radio frequency amplifier, fed by the second heterodyning means, adapted to operate in its nonlinear region near saturation to amplify and redistort such distorted radio frequency signal into the linearily amplified and retransmitted radio frequency signal, the characteristics of the distorting means being related to the nonlinear characteristics of the nonlinear radio frequency amplifier.

3,946,394

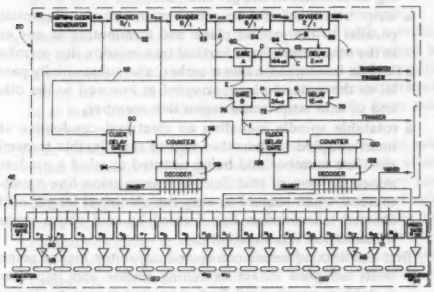
FIXED BEAM RADAR WITH RANGE LIGHT DISPLAY

Leonard M. Greene, Chappaqua, N.Y., assignor to Safe Flight Instrument Corporation, White Plains, N.Y.

Filed May 17, 1974, Ser. No. 471,349

Int. Cl.² G01S 9/06

U.S. Cl. 343—13 R **7 Claims**



4. A radar system comprising

a radar transmitter for transmitting pulses of radio frequency energy,

a fixed beam antenna for radiating the output of said transmitter,

a receiver for receiving radio frequency echoes from objects in the path of said antenna beam,

indicator means connected to receive the output of said receiver for providing a display indicating the ranges of said echoes, said indicator means comprising a bank of indicator devices, each of said devices representing a predetermined different bracket of ranges,

clock circuit means for generating trigger pulses for pulsing said transmitter and for generating synchronizing pulses for actuating each of said indicator devices during a time period corresponding to its respective range bracket, said clock circuit means including a clock generator for generating master clock pulses, divider means for dividing the frequency of said clock pulses to produce said trigger pulses, counter circuit means for counting said clock pulses, the count of said counter circuit means being initiated by said trigger pulses, and decoder circuit means responsive to the output of said counter circuit means for generating said synchronizing pulses for sequentially actuating said indicator devices, and

gating means for gating video signals from said receiver to said indicator devices in sequence in response to said synchronizing pulses, said decoder circuit means having a plurality of output lines, each of said output lines being connected to a corresponding gating means and providing synchronizing pulses thereto representing one of said predetermined bracket of ranges.

3,946,395

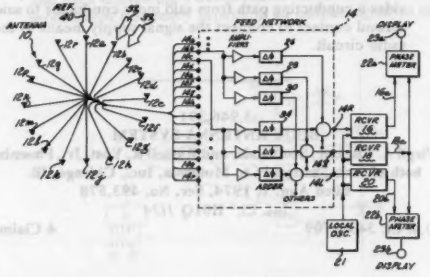
RADIO DIRECTION FINDING APPARATUS

C. Edward Kirchhoff, Rte. 2, Box 51-A, Conifer, Colo. 80433

Filed Apr. 17, 1974, Ser. No. 461,480

Int. Cl.² G01S 3/48

U.S. Cl. 343—113 R **17 Claims**



17. In a radio direction finding apparatus comprising a plurality of spaced apart element antennas for receiving a radiated signal from a source whose direction is to be determined, the radiated signal establishing phase displaced antenna element signals in element antennas of said array with the phase relationship of the signals depending upon the direction of the source, first means for combining said phase displaced antenna element signals to provide first and second resultant signals whose relative phases indicate the direction of said source, and means for measuring the phase difference therebetween, said first means comprising a quadrature coupler matrix for combining said antenna element signals at the frequency of received radiation for providing said first and second resultant signals.

3,946,396

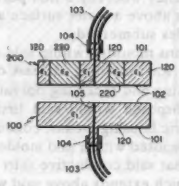
ANTENNA FOR PROVIDING A DIELECTRICALLY INDUCED, DIRECTIONALLY DEPENDENT RADIATION PATTERN PHASE SHIFT

Valor C. Smith, La Mesa; Marvin Gantsweg, Tarzana, both of Calif., and Ivan M. Faigen, Cochituate, Mass., assignors to The Magnavox Company, Fort Wayne, Ind.

Filed Mar. 6, 1974, Ser. No. 448,588

Int. Cl.² H01Q 19/06

U.S. Cl. 343—753 **6 Claims**



1. An omnidirectional, non-rotating antenna for providing a direction-dependent radiation pattern comprising:

means for emitting electromagnetic waves;

a region of dielectric material located in a propagation path of said means for emitting electromagnetic waves, wherein properties of said dielectrical region are a function of direction of said emitted electromagnetic waves relative to said antenna;

said emitting means produces omnidirectional electromagnetic waves;

said dielectric material region is disposed about said emitting means, said dielectric material region comprised of a dielectric material having uniform properties, a thickness of said uniform dielectric material is a function of angle relative to said emitting means thereby giving the omnidirectional waves a phase shift dependent on direction of the radiation pattern;

said thickness of said uniform dielectric material increases as a function of angle, said uniform dielectric material including a region of rapidly decreasing thickness; and

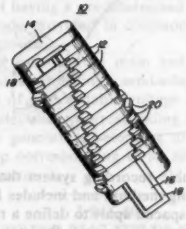
said thickness of said uniform dielectric material corresponding to a difference between maximum thickness of said uniform dielectric material and a minimum thickness of said uniform dielectric thickness causes electromagnetic waves of a preselected frequency propagating therethrough to be retarded by substantially one wavelength.

3,946,397

INDUCTOR OR ANTENNA ARRANGEMENT WITH INTEGRAL SERIES RESONATING CAPACITORS

James S. Irwin, Ft. Lauderdale, Fla., assignor to Motorola, Inc., Chicago, Ill.

Filed Dec. 16, 1974, Ser. No. 532,989
Int. Cl.² H01Q 7/08
U.S. Cl. 343—788 **8 Claims**



1. An improved series-resonant inductor circuit component arrangement, comprising in combination:

a wire conductor of a predetermined length wound in helical form of substantially uniform diameter and having respective ends for connection to associated circuitry, said conductor being divided into a plurality of individual wire segments, each capable of resonance at a particular frequency of interest; and

a plurality of series-resonating capacitors individually interconnecting a respective pair of said inductor wire segments, respectively, to form a plurality of series-resonant tuned circuits,

the number of said wire segments and said series-resonating capacitors being selected to determine generally the terminal impedance of said inductor arrangement presented at said terminal ends.

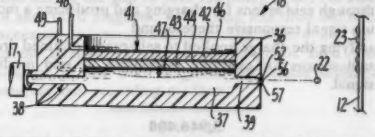
3,946,398

METHOD AND APPARATUS FOR RECORDING WITH WRITING FLUIDS AND DROP PROJECTION MEANS THEREFOR

Edmond L. Kyser, Portola Valley, and Stephan B. Sears, Belmont, both of Calif., assignors to Silonics, Inc., Sunnyvale, Calif.

Filed June 29, 1970, Ser. No. 50,445
Int. Cl.² G01D 15/16
U.S. Cl. 346—1 **3 Claims**

1. The method of projecting writing fluid droplets from an orifice comprising defining a confined volume of writing fluid, providing an ink reservoir in constant communication with said volume, and suddenly reducing the volume to project droplets from said orifice towards an associated printing medium, one droplet being projected out of said orifice each time



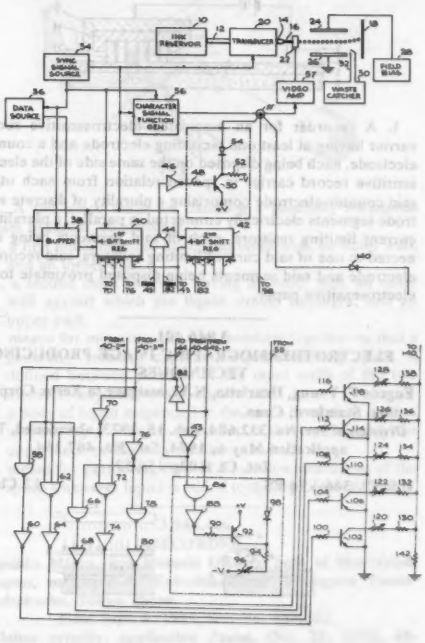
said volume is suddenly reduced and wherein the printing rate is between 100 and 3,000 droplets per second.

3,946,399

CHARGE COMPENSATION NETWORK FOR INK JET PRINTER

Joseph Zaretsky, Chicago, Ill., assignor to A. B. Dick Company, Chicago, Ill.

Filed Nov. 15, 1974, Ser. No. 524,037
Int. Cl.² G01D 18/00
U.S. Cl. 346—1 **15 Claims**



1. In an ink jet printer of the type wherein a stream of ink drops is projected through a means for charging individual drops responsive to video signals indicative of a desired printout, said stream of ink drops thereafter passing through an electric field to be deflected in accordance with the charges on said drops, thereafter terminating on a receiving substrate, the method of compensating the charge which would otherwise be applied to predetermined drops in a stream of ink drops for the effects of other charges in said stream of drops comprising the steps of

generating a train of signals simulating at any given moment, for a given stream of drops, the charge and no charge states which the drops in said stream of drops which have not yet passed through said means for charging will assume after passing through said means for

charging, at a time when a predetermined drop is passing through said means for charging,

sensing solely from said train of signals when a predetermined drop in a stream of charged drops is passing through said means for charging and producing a modifying signal responsive thereto, and

modifying the charge applied to said predetermined drop by said means for charging responsive to said modifying signal.

3,946,400

RECORDER FOR ELECTROSENSITIVE RECORD CARRIERS HAVING A SEGMENTED COUNTER ELECTRODE

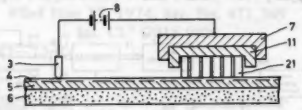
Paul Buro, Hamburg, Germany, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Mar. 21, 1974, Ser. No. 453,365

Claims priority, application Germany, Mar. 23, 1973, 2314506

Int. Cl.² G01D *15/06*; G03G *17/02*

U.S. Cl. 346—74 E **4 Claims**



1. A recorder for an associated electrosensitive record carrier having at least one recording electrode and a counter-electrode, each being disposed on the same side of the electrosensitive record carrier in spaced relation from each other, said counter-electrode comprising a plurality of discrete electrode segments electrically connected in parallel, a plurality of current limiting resistors, each of said segments being connected to one of said current limiting resistors, said recording electrode and said segments being disposed proximate to the electrosensitive paper.

3,946,401

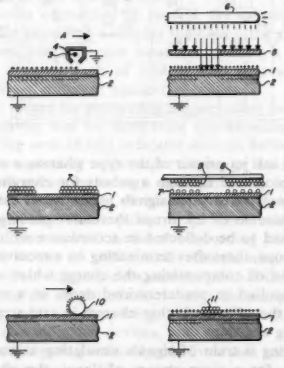
ELECTROTHERMOGRAPHIC IMAGE PRODUCING TECHNIQUES

Eugene F. Young, Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 332,684, Feb. 15, 1973, abandoned. This application May 6, 1974, Ser. No. 467,164

Int. Cl. G03g *15/052*

U.S. Cl. 346—74 ES **13 Claims**



1. A method of producing viewable images on a surface comprised on an oxide of a 3d transition metal, comprising the steps of:

establishing an ambient temperature of said surface below the insulator-to-metal transition temperature of said 3d transition metal oxide such that said 3d transition metal oxide exhibits low electrical conductivity;

depositing a uniform layer of electrostatic charge on said surface;

selectively increasing the temperature of certain portions of said surface above said insulator-to-metal transition temperature in accordance with a determined pattern such that said certain portions exhibit high electrical conductivity whereby said uniform layer of electrostatic charge is selectively dissipated to form an electrostatic latent image of said determined pattern; and

developing said electrostatic latent image to form a viewable image of said determined pattern.

3,946,402

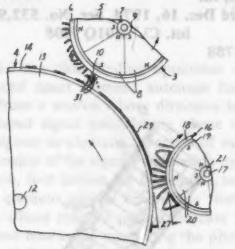
TONER APPLICATOR FOR ELECTROGRAPHIC RECORDING SYSTEM

George G. Lunde, White Bear Lake, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed May 28, 1974, Ser. No. 473,328

Int. Cl.² G03G *13/14*; G01D *15/06*

U.S. Cl. 346—74 ES **11 Claims**



1. An electrographic recording system that records toner images on a recording medium and includes first and second opposed electrodes spaced apart to define a recording region therebetween, means for driving the recording medium through said recording region, and a toner applicator for transporting electrically conductive toner powder from a toner reservoir to said recording region into a condition for being selectively deposited on said recording medium in response to the selective application of voltage record pulses across said electrodes, which toner applicator comprises:

a toner supply means for depositing a precise amount of said toner powder on a portion of one surface of said recording medium in a uniform layer of adjustable density, which toner powder is deposited prior to said portion entering said recording region; and

a force means for attracting said toner powder from said portion of said recording medium as said portion enters the recording region, and for arranging said toner to bridge between said first of said electrodes and said recording medium.

3,946,403

ELECTROSTATIC RECORDER WITH THREE STATE SWITCHING

Jun-ichiro Ikeuchi, Tokyo, and Teruo Tsutsumi, Machida, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed June 6, 1974, Ser. No. 476,796

Claims priority, application Japan, June 13, 1973, 48-66598; June 13, 1973, 48-66599; Nov. 29, 1973, 48-133696; Nov. 29, 1973, 48-133698; June 13, 1973, 48-69620[U]; June 13, 1973, 48-72685[U]

Int. Cl.² G03G *15/048*; G01D *15/06*

U.S. Cl. 346—74 EE **11 Claims**

1. An electrostatic recorder comprising:

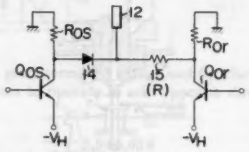
a plurality of recording electrodes aligned in a line at pre-

scribed intervals and divided into a plurality of electrode groups;

a plurality of series members each comprising a diode and main resistor connected in series and having a common connection point connected to one of said recording electrodes;

a plurality of first drive pulse generators each having an output terminal connected to a given one of the recording electrodes included in each of said plurality of electrode groups via the diode and operated in response to recording signals to generate high voltage pulses;

a plurality of second drive pulse generators each of which has an output terminal connected via the main resistor to the recording electrodes included in the corresponding



one of said electrode groups and which are sequentially operated in response to control signals to generate high voltage pulses;

said first and second drive pulse generators each having an additional resistor connected between its output terminal and a point having a predetermined potential;

a rear electrode provided in common for the plurality of electrode groups;

the resistance ratio of the main and additional resistors having a value permitting a semi-selected voltage of 50 to 70 percent of a recordable voltage to be applied to the recording electrodes corresponding to non-actuated first drive pulse generators belonging to the recording electrode group corresponding to an actuated second drive pulse generator.

3,946,404

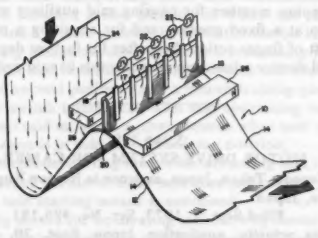
DIRECT CURRENT BIAS FIELDS FOR MAGNETIC PRINTING

Ami E. Berkowitz, Schenectady, and Joseph A. Lahut, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 25, 1975, Ser. No. 571,594

Int. Cl.² G01D *15/12*; G03G *19/00*

U.S. Cl. 346—74.1 **19 Claims**



1. A method of recording magnetic information on a sheet of magnetic recording medium comprising:

premagnetizing said magnetic recording medium with a first magnetic field oriented in a first direction;

biasing said magnetic recording medium with a second magnetic field, said second magnetic field being oriented in a second direction opposite to the direction of said first magnetic field, the strength of said second magnetic field being less than the strength necessary to saturate said recording medium;

applying the poles of a recording head to said recording medium in the presence of said magnetic field; said poles defining a gap parallel to the direction of said second magnetic field;

applying electric current to said magnetic recording head, said current being adapted to produce a third magnetic field across the gap of said recording head, the strength of said third magnetic field being less than the strength necessary to saturate said recording medium and the sum of the strength of said second magnetic field and the strength of said third magnetic field being sufficient to saturate said recording medium.

3,946,405

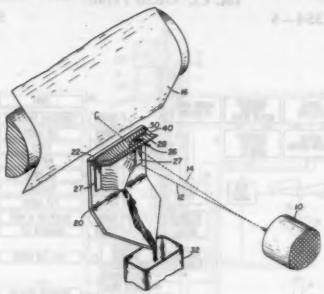
INK JET MASK

James M. Berry, Deerfield; Anthony J. Hauser, Stone Park, and Carl D. Swanson, Arlington Heights, all of Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed Oct. 29, 1974, Ser. No. 518,699

Int. Cl.² G01D *15/18*

U.S. Cl. 346—140 R **8 Claims**



1. A two-piece mask for catching a generally horizontal stream of liquid, comprising:

a. a first mask member having an inner wall, an outer wall, and an upper end;

b. a second mask member having an inner wall, an outer wall against which the liquid stream impinges, and an upper end;

c. means for mounting the two members together so that a generally vertical, capillary, liquid-receiving space is defined between portions of the inner walls of the two members adjacent to the upper-ends;

d. a body of liquid suspended in the space by surface tension and having a concave meniscus at the top bridging the upper ends of the two members; and

e. means for permitting flow of liquid downward, out of the space whenever liquid is added to the top of the meniscus.

3,946,406

RECORDER

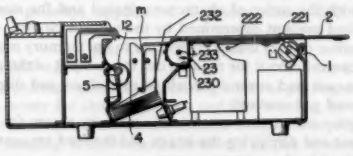
Shigetaka Miura, and Masashi Oikawa, both of Musashino, Japan, assignors to Kabushikikaisha Yokogawa Denki Seisakusho, Tokyo, Japan

Filed Sept. 5, 1974, Ser. No. 503,282

Claims priority, application Japan, Oct. 25, 1973, 48-120115

Int. Cl.² G01D *11/24*, *11/30*

U.S. Cl. 346—145 **9 Claims**



1. A recorder comprising: a flat bed disposed on top of a case holding a chart thereon and movable in the direction of said chart being transmitted and also in the contrary direction

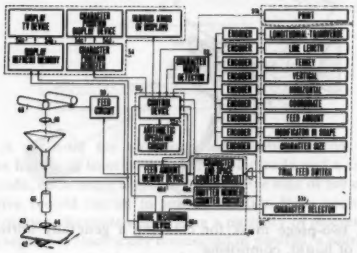
thereof; a cylindrical support member fixed at one end of said flat bed and located within said case; a chart feed wheel supported at two ends of a rotating shaft extended in said cylindrical support member in its axial direction; a chart storage part disposed in a recess in the case, yet readily accessible through an opening formed on the case as said flat bed is moved; and a chart arranged in said chart storage part to be sent out gradually by said chart feed wheel over the flat bed by way of said cylindrical support member.

3,946,407

MANUALLY OPERATED PHOTOCOMPOSING APPARATUS

Kiyoshi Ishii; Shigeru Fuse, and Masatake Takashima, all of Tokyo, Japan, assignors to Shaken Co., Ltd., Tokyo, Japan

Filed Sept. 3, 1974, Ser. No. 502,534
Claims priority, application Japan, Sept. 5, 1973, 48-99822
Int. Cl.² G03B *19/00*
U.S. Cl. 354—6 5 Claims



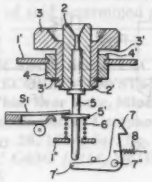
1. A manually operated photocomposing apparatus comprising:
- a character matrix comprising characters, marks and character width codes,
- means for selecting the characters and marks,
- character width detecting means for reading out the character width codes corresponding to the characters and marks selected by the character selecting means,
- means for photoelectrically converting an image of the selected character or mark,
- an instruction button group for defining various kinds of information and for applying the information as input signals,
- a control circuit connected to the character width detecting means and the instruction button group for calculating and determining a feed amount of the character selected by the selecting means in accordance with an information signal from the instruction button group and a character width information signal to determine the feed amount,
- memory means connected to the photoelectrically converting means and control circuit for memorizing the photoelectrically converted character image in accordance with the order of character selected and for storing the feed amount determined by the control circuit,
- monitor display means connected to the memory means and control circuit for reading out the content of the memory means and control circuit to reproduce and display the read out content,
- display means connected to the memory means for reading out and displaying the image and the feed amount memorized in the memory means,
- print means for printing the image displayed at the display means onto a photosensitive medium.

3,946,408

SHUTTER RELEASE DEVICE IN CAMERA

Tatsuya Taguchi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 350,204, April 11, 1973. This application Oct. 10, 1974, Ser. No. 513,537
Claims priority, application Japan, Apr. 28, 1972, 47-50360[U]
Int. Cl.² G03B *7/08, 17/38*
U.S. Cl. 354—51 4 Claims



1. In a single-lens reflex camera equipped with a through-the-picture-taking-lens light metering system and an electronic exposure control system responsive to the output of said metering system said metering system having a memorizing means and a light measuring device a shutter release device comprising:
- a shutter release member which is spring-biased towards a rest position thereof and capable of being manually depressed to an end position;
- a shutter release mechanism which is so disposed as to be tripped, only when said shutter release member is in the immediate vicinity of its said end position;
- switch means for transmitting an output from said light measurement device to said memorizing means by being closed in interconnection with depression of the shutter release member from the rest position thereof to an intermediate position;
- an auxiliary member, provided around said shutter release member, for causing said shutter release member to shift to said intermediate position by the depression of said auxiliary member with a finger; and
- a stopping member for causing said auxiliary member to stop at a fixed position and for requiring a pivoting or shift of finger action thereafter for further depression of said shutter release member towards its said end position.

3,946,409

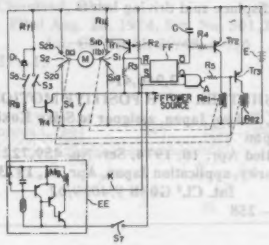
MOTOR DRIVE SYSTEM FOR CAMERA

Kenji Toyoda, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Sept. 7, 1973, Ser. No. 395,181
Claims priority, application Japan, Sept. 20, 1972, 47-93680; Sept. 20, 1972, 47-93681
Int. Cl.² G03B *1/12*
U.S. Cl. 354—173 9 Claims

1. A motor drive system for a camera, comprising a reversible electric motor, a drive shaft for film advancement, means responsive to operation of said motor in one direction for turning said shaft from an initial position in a direction to advance film in said camera and responsive to subsequent operation of said motor in the opposite direction for turning said shaft back to said initial position, means for energizing said motor to operate in said one direction, and motor torque

responsive means including means for detecting the current drawn by said motor for sensing when said film has been



advanced to a predetermined extent and for thereupon energizing said motor to operate in said opposite direction.

3,946,410

ELECTROMAGNETIC TRIGGER DEVICE

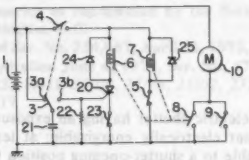
Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed July 19, 1974, Ser. No. 490,220

Claims priority, application Japan, July 24, 1973, 48-82707; July 24, 1973, 48-82708; Oct. 26, 1973, 48-119963; Feb. 1, 1974, 49-12859

Int. Cl.² G03B *1/18*

U.S. Cl. 354—173 **9 Claims**



1. An electromagnetic trigger device in a camera comprising:

a rotary motor;

a mechanism interlocked with said motor for driving a shutter and transporting film, said mechanism being moved between a first position in which the shutter is open and a second position in which the shutter is closed;

restraining means movable between a restraining position, in which said restraining means restrains said mechanism in said second position, and a non-restraining position;

a motor switch interlocked with said restraining means to connect said motor to a power source when said restraining means is in said non-restraining position;

electromagnetic starting means for attracting said restraining means to move it to said non-restraining position when said starting means is energized;

switching means for connecting said starting means to said power source when said switching means is conductive;

a starting capacitor;

a trigger switch for connecting selectively said starting capacitor to said power source before the start of photography and then to said switching means to apply the terminal voltage of said starting capacitor to said switching means to render it conductive;

reset means responsive to rotation of said motor to render said switching means non-conductive when said motor has made a predetermined number of revolutions within the number of revolutions required for the motor to transport one frame of film;

a mode selecting switch for selecting one of continuous photography and one-frame photography; and

electromagnetic holding means connected to said power source to hold said restraining means in said non-restraining position when said mode selecting switch selects said continuous photography.

3,946,411

FILM CASSETTE

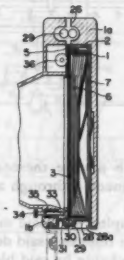
Yoshio Asano, Nishinomiya, and Kinji Ohkubo, Minami-ashigara, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 23, 1974, Ser. No. 463,346

Claims priority, application Japan, Apr. 23, 1973, 48-45902

Int. Cl.² G03B *19/00*

U.S. Cl. 354—174 **5 Claims**



1. A film cassette containing a plurality of film monosheets comprising a lightproof case, said case having a front wall having an opening therethrough through which said film monosheets may be exposed, a first end wall having a removal passage therethrough, through which exposed film monosheets may pass, a first adjustable lightproof means provided to normally close said removal passage, a second end wall having an insertion passage therethrough, a second adjustable lightproof means provided to normally close said insertion passage, means for urging film monosheets toward said front wall of said cassette, and a lightproof protective board, which is locatable between the forwardmost film monosheet and said front wall of said cassette to protect said film monosheets from exposure to light through said opening through said front wall, said lightproof board being removable from said cassette through said, first end wall opening and insertable into said forwardmost position in said cassette through said opening in said second end wall.

3,946,412

PHOTOGRAPHIC CAMERA HAVING ELECTRIC MOTOR DRIVE FOR SHUTTER COCKING AND FILM WINDING

Werner Hahn; Herbert Scholze, and Rolf Seifert, all of Dresden, Germany, assignors to Veb Pentacon Dresden, Dresden, Germany

Filed July 22, 1974, Ser. No. 490,720

Claims priority, application Germany, Aug. 29, 1973, 173137

Int. Cl.² G03B *17/00*

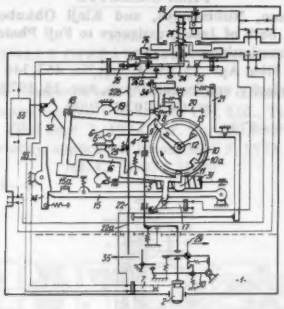
U.S. Cl. 354—204 **4 Claims**

1. In a photographic camera having a mirror gearing and an electric motor for shutter cocking and film winding, in which the current connection for the electric motor situated in the camera housing is controlled alternately by the shutter and film winding, the provision of:

a. a manual release mechanism;

b. a remote release mechanism;

c. a shaft;
d. a detent disc mounted on said shaft and driven by said electric motor;
e. a release lever mounted on said shaft;
f. a first blocking lever for inhibiting the movement of said release lever and connectable both with said manual release and said remote release;
g. a second blocking lever for inhibiting the movement of said release lever;



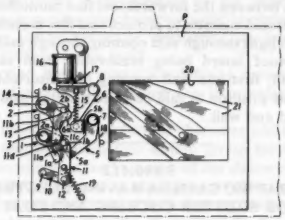
h. a detent lever with a nose thereon for engaging said detent disc and connected through a joint with said second blocking lever;
i. a blocking pawl coupled with said mirror gearing;
j. an actuator lever for releasing said detent lever from said detent disc and blockable by said blocking pawl;
k. a dog driven by said motor for tensioning said actuator lever.

3,946,413

SHUTTER BLADE REBOUND PREVENTIVE DEVICE FOR CAMERA SHUTTER

Eiichi Onda; Mitsuo Koyama, and Tadashi Nakagawa, all of Yotsukaido, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Dec. 31, 1974, Ser. No. 537,768
Int. Cl.² G03B 9/06, 9/08
U.S. Cl. 354—251 **3 Claims**



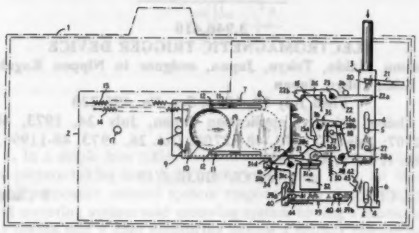
1. In a camera shutter having an exposure operture; a plurality of shutter blades operable to opened and closed positions for opening the exposure aperture and closing it; operating means connected to the shutter blades for operating the shutter blades to said opened and closed positions; rebound preventing means in said operating means to preclude the operating means from rebounding upon reaching terminal operating positions thereof corresponding to reaching of said opened and closed positions of said shutter blades thereby to preclude rebounding of said shutter blades when they reach said opened and closed positions; said rebound preventing means comprising relatively displaceable driving levers constituting part of said operating means and cocking means, means on said driving levers for engaging said driving levers with said cocking means when either of said driving levers reaches a terminal operating position and for precluding rebounding of said driving levers; and said operating means including means to relatively displace said driving levers.

3,946,414

ELECTRIC SHUTTER WITH POSITIVE MOTION DEVICE

Kiyoshi Kitai, Tokyo, Japan, assignor to Seiko Koki Kabushiki Kaisha, Japan

Filed Apr. 10, 1974, Ser. No. 459,722
Claims priority, application Japan, Apr. 11, 1973, 48-42698
Int. Cl.² G03B 9/40, 9/62
U.S. Cl. 354—258 **2 Claims**

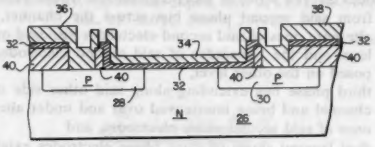


1. In an electric shutter having an exposure aperture, an electromagnet electrically energizable; at least one shutter blade operable to a shutter-opening position for opening the aperture for taking an exposure and a shutter-closing position closing the exposure aperture; and a release element for initiating the energization of said electromagnet and the taking of an exposure; shutter-operating means activated by the release element for actuating said shutter blade to said shutter-opening position and shutter-closing position; said shutter-operating means comprising an attractable lever attracted by said electromagnet when energized and having means cooperative with said shutter blade for maintaining said shutter blade in said shutter-opening position; means biasing said attractable lever away from said electromagnet; a pivotally mounted press lever; a pivotally mounted locking lever; means biasing said press lever into engagement with said attractable lever for pressing said attractable lever against said electromagnet when the shutter is in a cocked condition; means biasing said locking lever to a position for releasably locking said press lever when pressing on said attractable lever; means on said press lever in the path of travel of said release element for actuating said press lever under control of said release element to a position releasing said attractable lever upon initiation of taking of an exposure by said release element after energization of said electromagnet is initiated; means cooperative with said shutter blade maintaining said locking lever in an unlocking condition releasing said press lever when the shutter is cocked and in readiness for positioning in a locking position for locking said press lever under control of said biasing means thereof when an exposure is initiated; said means cooperative with said shutter blade comprising means restoring said locking lever to said unlocking position when said shutter is cocked, and means cooperative with said release element for initiating taking of an exposure.

3,946,415
NORMALLY OFF SCHOTTKY BARRIER FIELD EFFECT TRANSISTOR AND METHOD OF FABRICATION

Koy B. Cook, Jr., Cupertino, Calif., assignor to Harris Corporation, Cleveland, Ohio

Filed Aug. 28, 1974, Ser. No. 501,204
Int. Cl.² H01L *29/48, 29/56*
U.S. Cl. 357—15 10 Claims

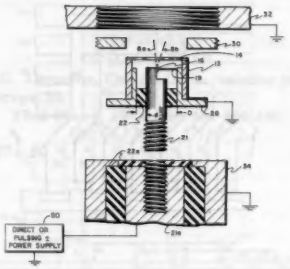


1. A normally off field effect transistor comprising:
a substrate of a first conductivity type semiconductor material;
a source and drain in said substrate of a conductivity type opposite said first conductivity type and separated by a channel region of said substrate;
a first layer of substantially undoped semiconductor material of said first conductivity type contacting and covering a surface of said channel region; and
a metal gate layer upon said first layer and forming a Schottky barrier with said first layer.

3,946,416
LOW IMPEDANCE DIODE MOUNTING STRUCTURE AND HOUSING

Michael Hacskaylo, Falls Church, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 354,067, April 24, 1973, abandoned. This application June 4, 1974, Ser. No. 476,249
Int. Cl.² H01L *33/00, 23/48, 23/02, 23/12*
U.S. Cl. 357—17 5 Claims

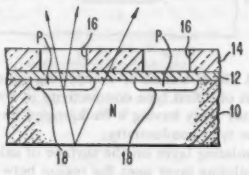


1. A low input impedance mounting structure and housing for a high power laser diode driven at high frequency and short pulse widths at room temperature comprising:
an electron injection high power laser diode of the gallium aluminum arsenide single heterojunction and close confinement structure, said high power laser diode having a first side and a second side;
a high frequency and short pulse width power source;
a large diameter highly conductive central electrode which is connected to said power source at one end and having said first side of the high power laser diode electrically connected to a heat sink at the other end thereof;
a thin insulator layer contiguous with and surrounding said highly conductive central electrode;
a conductive housing that is electrically grounded and is contiguous with said insulator layer, said conductive housing having a transparent window along the optical axis of said high power laser diode; and
a short electrical lead connected between said conductive housing and said second side of the high power laser diode whereby said thin insulator layer is of such a size when compared with the large diameter highly conductive central electrode as to minimize the capacitive reactance and balance with the inductive reactance between said central electrode and said housing to provide minimum input impedance.

3,946,417
MINIMIZING CROSS-TALK IN L.E.D. ARRAYS

William N. Jacobus, Jr., Essex Junction, Vt., and San-Mei Ku, Poughkeepsie, N.Y., assignors to IBM Corporation, Armonk, N.Y.

Division of Ser. No. 265,122, June 22, 1972, Pat. No. 3,846,193. This application Aug. 12, 1974, Ser. No. 496,481
Int. Cl.² H01L *33/00, 29/34;* H01S *33/19*
U.S. Cl. 357—17 11 Claims

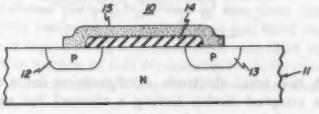


1. An array of closely spaced light emitting devices comprising:
a semiconductor substrate including materials from the Group III-V elements and doped with an impurity of a first conductivity type;
a thin layer of silicon oxide material in adherent contact with a first major surface of said substrate;
a layer of silicon nitride material in adherent contact with selected portions of said silicon oxide;
an impurity of a second conductivity type being introduced into said substrate through said silicon oxide layer as masked by the said layer of silicon nitride material forming a P-N junction; and
a light absorbing layer formed by said impurity of said second conductivity type being also introduced into a second major surface, contiguous with the entire second major surface of said substrate.

3,946,418
RESISTIVE GATE FIELD EFFECT TRANSISTOR

Raymond A. Sigsbee, Schenectady, and William D. Barber, Elnora, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 1, 1972, Ser. No. 302,799
Int. Cl.² H01L *29/78*
U.S. Cl. 357—23 12 Claims



1. A constant voltage load comprising:
a semiconductor substrate of a first conductivity type;

first and second regions of an opposite conductivity type formed in said substrate;

insulating means overlying the area on said substrate between said first and second regions;

resistive gate means overlying said insulating means and in electrical contact with said first and second regions.

3,946,419

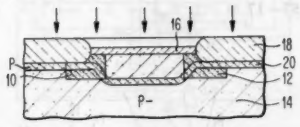
FIELD EFFECT TRANSISTOR STRUCTURE FOR MINIMIZING PARASITIC INVERSION AND PROCESS FOR FABRICATING

David DeWitt, Poughkeepsie, and William S. Johnson, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 374,152, June 27, 1973, Pat. No. 3,860,454. This application Nov. 7, 1974, Ser. No. 521,709

Int. Cl.² H01L *29/78, 29/34*

U.S. Cl. 357—23 **6 Claims**



1. A field effect transistor comprising spaced source and drain regions of a first type conductivity in a monocrystalline semiconductor body having a background impurity of a second opposite type conductivity,

a field insulating layer on the surface of said body,

a gate insulating layer over the region between said source and said drain regions,

a layer of second type conductivity impurity having an average concentration significantly higher than the impurity concentration of said background impurity located in the body adjacent the interface of said field insulating layer and body, and located under the gate insulating layer at a depth approximately equal to the thickness of the field insulating layer less the thickness of the gate insulating layer.

3,946,420

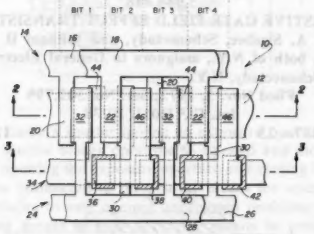
TWO LEVEL ELECTRODE CONFIGURATION FOR THREE PHASE CHARGE COUPLED DEVICE

Glenn A. Hartsell, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 28, 1974, Ser. No. 483,993

Int. Cl.² H01L *29/78, 23/48*

U.S. Cl. 357—24 **10 Claims**



1. A two level electrode configuration for a three phase charge coupled device having a channel for movement of charge packets comprising:

a first phase bus extending along one side of the channel and having electronically interconnected upper and lower level portions,

a dual layered series of first phase electrodes extending from said first phase bus across the channel, with alternate ones of said first electrodes disposed on said upper level and the remainder of said first electrodes disposed on said lower level,

a second phase bus extending along the other side of the channel and having electrically interconnected portions on said upper and lower levels,

a dual layered series of second phase electrodes extending from said second phase bus across the channel, with alternate ones of said second electrodes disposed on one level and the remainder of said second electrodes disposed on the other level,

a third phase bus extending along said other side of the channel and being interleaved over and under alternate ones of said second phase electrodes, and

a dual layered series of third phase electrodes extending from said third phase bus across the channel with alternate ones of said third electrodes disposed on one level and the remainder of said third electrodes disposed on the other level,

such that along said channel there is a series of phase electrode sets, each said set comprising a first phase electrode, a second phase electrode, and a third phase electrode, said phase electrodes arranged in the same repeating sequence in each electrode set,

and insulating means interposed between adjacent ones of said phase electrodes.

3,946,421

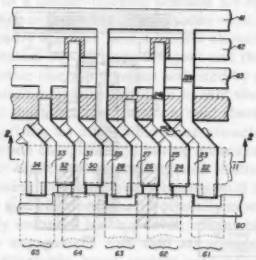
MULTI PHASE DOUBLE LEVEL METAL CHARGE COUPLED DEVICE

Glenn A. Hartsell, and Allan R. Kmetz, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 28, 1974, Ser. No. 484,359

Int. Cl.² H01L *27/10;* **G08C** *15/08*

U.S. Cl. 357—24 **14 Claims**



1. In an n phase serial charge coupled device shift register where a set of phase buses extend parallel one to another at plural levels above the surface of a semiconductor body displaced from one side of a channel formed in said body, which comprises:

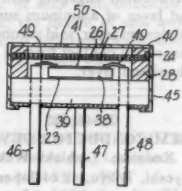
a. an array of phase electrodes positioned in at least two levels above said channel in spanning relation thereto with adjacent electrodes in different levels and separated by an insulating layer,

b. secondary bus means to interconnect one of said electrodes in one level to an electrode spaced n electrodes therefrom in said array in a different level by way of a via through said layer intermediate said buses and said one side with an extension to one of said buses.

3,946,422
ELECTRET TRANSDUCER HAVING AN ELECTRET OF INORGANIC INSULATING MATERIAL

Hajime Yagi, Tokyo; Yoshihiro Saito, Machida, and Koji Hirano, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 311,472, Dec. 4, 1972, abandoned. This application May 30, 1974, Ser. No. 474,657
Claims priority, application Japan, Dec. 2, 1971, 46-97436
Int. Cl.² H01L 29/84, 29/96
U.S. Cl. 357—26 **7 Claims**



1. An electret transducer comprising:

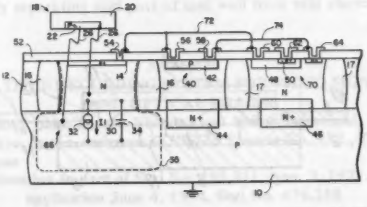
a first member including a sheet of inorganic insulating material having electric charges bound therein and consisting of first and second contiguous layers of material, the material of said first layer being selected from the group consisting of: silicon dioxide, silicon nitride, aluminum oxide, titanium dioxide, and an adduct of phosphorous pentoxide and silicon dioxide and the material of said second layer being selected from the group consisting of silicon dioxide, silicon nitride, aluminum oxide, titanium dioxide, and an adduct of phosphorous pentoxide and silicon dioxide, but being different from said material of said first layer; and

a second member including an electrode juxtaposed with respect to said sheet and spaced therefrom and parallel thereto, one of said members being movable with respect to the other of said members to vary the electric field induced in said electrode by said electric charge.

3,946,423
OPTO-COUPLER

Lawrence G. Augustine, Phoenix, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed May 2, 1974, Ser. No. 466,586
Int. Cl.² H01L 27/14
U.S. Cl. 357—30 **13 Claims**



1. An integrated circuit detector means responsive to an incident radiation supply means for generating an output current comprising:

a. a body of semiconductor material for receiving the incident radiation at a first surface;

b. said body comprising a substrate of a first conductivity type and an overlying layer of opposite conductivity type, said substrate having second and third surfaces separated from said first surface, said second surface being disposed intermediate to said first and third surfaces;

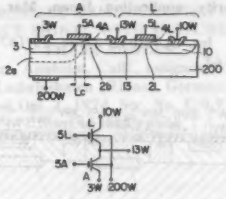
c. a subsurface PN junction detector means located at approximately said second surfaces coupled to a reverse bias supply means for absorbing substantially all incident radiation and generating an output current;

d. at least a first active device having active regions disposed in said overlying layer and coupled to said subsurface PN junction.

3,946,424
HIGH FREQUENCY FIELD-EFFECT TRANSISTORS AND METHOD OF MAKING SAME

Yasuo Tarui, Kurume, and Yutaka Hayashi, Hoya, both of Japan, assignors to Kogyo Gijutsuin, Japan

Continuation of Ser. No. 305,760, Nov. 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 55,368, July 16, 1970, abandoned. This application Aug. 13, 1974, Ser. No. 497,061
Claims priority, application Japan, Oct. 31, 1969, 44-86871; Oct. 31, 1969, 44-86872; Oct. 31, 1969, 44-86873
Int. Cl.² H01L 27/02
U.S. Cl. 357—42 **12 Claims**



1. An integrated circuit comprising a high resistivity semiconductor body having

a. a surface portion and containing a low concentration of impurities of one conductivity type and a resistivity of at least 100 ohm-cm,

b. a first region of said one conductivity type located in said surface portion of the semiconductor body having diffused therein impurities of said one conductivity type to provide an impurity concentration in said first region higher than that in said semiconductor body,

c. a second region located in a part of surface portion of said first region with said first region underlying and around said second region, said second region having diffused therein impurities of the opposite conductivity type to provide an impurity concentration in said second region higher than that in said first region,

d. a third region located in said surface portion of said semiconductor body spaced from said first and second regions and having diffused therein impurities of the same type of conductivity and same concentration as said second region, said third region being separated from said second region by a surface portion of said semiconductor body of said low impurity concentration and by a surface portion of said first region of higher impurity concentration,

e. a fourth region located in said surface portion of said semiconductor body spaced from said third region and having diffused therein impurities of the same type of conductivity and same concentration as said third region, said fourth region being separated from said third region by a surface portion of said semiconductor body containing a low concentration of impurities of said one conductivity type,

f. an insulating layer of one and the same material extending over said surface portion of said semiconductor body including said first region, second region, third region and fourth region and intervening portions of said surface

portions, with windows over said second, third and fourth regions, and

g. metal deposited on said body to form ohmic contacts through said windows with said second, third and fourth regions and gate electrodes overlying said insulating layer over said portion of said first region disposed between said second and third regions and over said surface portion of said semiconductor body disposed between said third and fourth regions,

h. said second and third regions comprising the source and drain of an amplifying transistor of an enhancement type and said third and fourth regions comprising the source and drain of a load transistor of a depletion type connected in series with said amplifying transistor.

3,946,425

MULTI-EMITTER TRANSISTOR HAVING HEAVILY DOPED N+ REGIONS SURROUNDING BASE REGION OF TRANSISTORS

Senji Shoji; Kenjiro Yasunari, and Yasunobu Kosa, all of Kodaira, Japan, assignors to Hitachi, Ltd., Japan

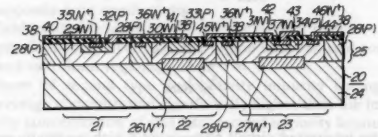
Division of Ser. No. 332,520, Feb. 14, 1973, abandoned, which is a division of Ser. No. 16,018, March 3, 1970, abandoned.

This application May 14, 1974, Ser. No. 469,745

Claims priority, application Japan, Mar. 12, 1969, 44-18336

Int. Cl.² H01L 27/04, 29/167

U.S. Cl. 357—64 **13 Claims**



10. An integrated circuit device comprising:

a semiconductor body having a major surface, said body being doped with a life time killer material;

a plurality of transistors formed in the major surface so as to be spaced from each other, each transistor including a P-type base region,

at least one P-type isolation region formed between said transistors so as to electrically isolate said transistors from each other, and at least one heavily doped N-type semiconductor region formed in the major surface, so as to essentially surround each base region of each of said transistors, at least a portion of said heavily doped N-type semiconductor region being disposed in said isolation region.

3,946,426

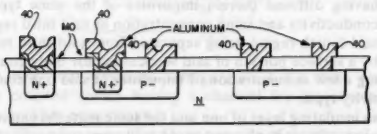
INTERCONNECT SYSTEM FOR INTEGRATED CIRCUITS

Thomas J. Sanders, Indialantic, Fla., assignor to Harris Corporation, Cleveland, Ohio

Continuation of Ser. No. 341,049, March 14, 1973, abandoned. This application Sept. 6, 1974, Ser. No. 503,980

Int. Cl.² H01L 23/48, 29/44, 29/54

U.S. Cl. 357—71 **7 Claims**



1. A semiconductor device comprising:

a silicon wafer having P and N conductivity type regions therein and having one face coated with a silicon oxide;

a first layer of molybdenum engaging a surface of selective N conductivity type regions in an opening in said oxide coating, thereby forming an ohmic contact;

a first layer of aluminum engaging a surface of selective P conductivity type regions in an opening in said oxide, thereby forming an ohmic contact, the metal engaging said selected N regions being only molybdenum and the metal engaging said selected P regions being only aluminum; and

a plurality of interconnections, each including a second layer of molybdenum engaging said silicon oxide layer and a second layer of aluminum superimposed on said second molybdenum layer, said second layer of aluminum engages a respective contact formed by said first molybdenum or aluminum layer.

3,946,427

SEMICONDUCTOR DEVICE

Hideo Iwasawa, Kodaira; Yoshiaki Wakashima, Kawasaki, and Hideo Inayoshi, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 15, 1974, Ser. No. 514,956

Claims priority, application Japan, Oct. 12, 1973, 48-113928

Int. Cl.² H01L 23/30

U.S. Cl. 357—72 **8 Claims**

1. A semiconductor device comprising a semiconductor element having at least one P—N junction therein and a covering of a silicone varnish on a surface, of said semiconductor element, said silicone varnish containing methyl radicals and phenyl radicals as side chain radicals and having in the side chain radicals a ratio between said methyl radicals and said phenyl radicals of at least 20:1.

3,946,428

ENCAPSULATION PACKAGE FOR A SEMICONDUCTOR ELEMENT

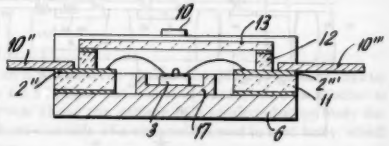
Shinzo Anazawa; Seiichi Ueno; Isamu Nagasako; Tadashi Nawa; Toshiaki Irie, and Shigeru Sando, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Sept. 17, 1974, Ser. No. 506,872

Claims priority, application Japan, Sept. 19, 1973, 48-105715; May 24, 1974, 49-58958

Int. Cl.² H01L 23/02, 25/04

U.S. Cl. 357—74 **12 Claims**



1. A semiconductor device comprising a metal substrate maintained at a constant voltage; first and second insulative segments disposed on a main surface of said metal substrate; an auxiliary metal stud mechanically mounted on and electrically connected to said main surface of said metal substrate at

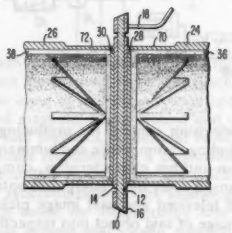
a position between said first and second insulative segments; a semiconductor element having a first, a second, and a third electrode, said semiconductor element being mounted onto said auxiliary metal stud; first and second electrode members formed respectively on said first and second insulative segments, said first and second electrode members being parallel with said main surface of said metal substrate and positioned at the opposing sides of said auxiliary metal stud so that said first electrode member, said auxiliary metal stud, and said second electrode member are arranged in a line; means for electrically connecting said first and second electrodes of said semiconductor element to said first and second electrode members, respectively; and means for electrically connecting said third electrode of said semiconductor element to said auxiliary metal stud; the height of said auxiliary metal stud being selected to shield electrostatically said first and second electrode members from each other.

3,946,429

SELF-FUSING TRANSCALENT ELECTRICAL DEVICE

Sebastian William Kessler, Jr., Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,879
Int. Cl.² H01L *23/02, 25/04;* **F28F** *7/00;* **H02H** *5/04*
U.S. Cl. 357—81 **8 Claims**



1. An electrical device comprising an electronic component having a plurality of electrodes for connecting the component into a circuit, at least one cooling chamber bonded to one of said electrodes for cooling said component, said cooling chamber including a metal wall fixed to said one electrode, a connector terminal fixed to a part of said metal wall and spaced from said one electrode, wherein the improvement comprises said metal wall having a thinned wall region completely separating said part of said wall from said electrode.

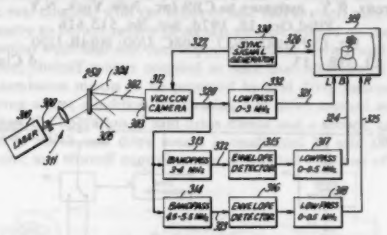
3,946,430

MULTIPLE RECORDING SYSTEM FOR VIDEO SIGNALS AND OPTICAL IMAGES

Atsufumi Ueki; Nobuo Nishida, and Shinji Takahashi, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 195,311, Nov. 3, 1971. This application June 4, 1974, Ser. No. 476,258
Claims priority, application Japan, Nov. 6, 1970, 45-97621
Int. Cl.² H04N *9/02*
U.S. Cl. 358—2 **11 Claims**

8. In combination in a multiple image recording system, a plurality of transparent positive pictures each having information rendered therein in distinct relative spatial frequency regions, hologram recording means, means for supplying separate coherent light beams through each of said positive pictures to said hologram recording means, means for supplying a reference coherent light beam to said hologram recording means, and spatial frequency filter means optically



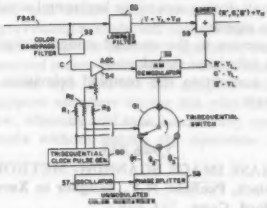
disposed intermediate at least one of said positive pictures and said hologram recording means to eliminate distortion of said information.

3,946,431

SYNCHRONIZED DEMODULATION OF THE CHROMINANCE SIGNAL WITH SWITCHED CARRIER PHASE ANGLES

Manfred Gantert, Anaheim, Calif., assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Oct. 1, 1974, Ser. No. 510,910
Int. Cl.² H04N *9/34*
U.S. Cl. 358—9 **6 Claims**



6. In a color video system of the type in which the chrominance component of a composite video signal is transmitted or recorded as a trisequential sequence containing the substitute color signals R′, G′, B′ and in which at the receiving or playback end there is derived from the trisequential substitute color signals a luminance signal $Y_M = 0.33(R'+G'+B')$ where R′, G′, B′ are chosen so as to substantially satisfy the relationship, $Y_M = +0.30R + 0.59G + 0.11B$, required for black and white compatibility,

the method of producing said sequence of substitute color signals, comprising the steps of:

deriving from a synchronized unmodulated subcarrier three subcarrier phases along the axes R′—Y, G′—Y, B′—Y, respectively;

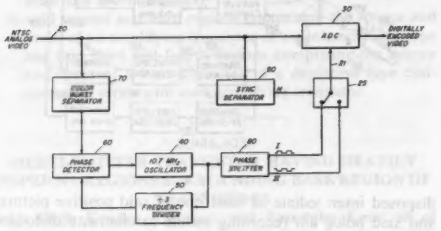
synchronously demodulating the chrominance component of said composite video signal trisequentially along the associated axes with the aid of said subcarrier phases to generate the signals $R'-Y_L$, $G'-Y_L$, $B'-Y_L$;

and adding thereto the luminance component $Y=Y_L+Y_H$ of the composite video signal where Y_L is the low-frequency portion and Y_H the high-frequency portion of the luminance component, thereby to produce the trisequential signal $(R', G', B') + Y_H$ for transmission or recording.

3,946,432
APPARATUS FOR DIGITALLY ENCODING A TELEVISION SIGNAL

Abraham A. Goldberg, Stamford, Conn., and John P. Rossi, Bronx, N.Y., assignors to CBS Inc., New York, N.Y.

Filed Oct. 10, 1974, Ser. No. 513,616
Int. Cl.² H04N 9/33; G08C 5/00; H04B 1/00
U.S. Cl. 358—13 4 Claims



1. Apparatus for digitally encoding an NTSC color television signal, comprising:

means for generating a first sampling signal having a characteristic frequency of three times the NTSC color subcarrier signal;

means for generating a second sampling signal having a characteristic frequency of three times the NTSC color subcarrier signal, said second sampling signal having its sampling reference points interspersed equally in time between the sampling reference points of said first sampling signal;

enabling means responsive to the NTSC color television signal for alternately enabling said first and second sampling signals during successive horizontal scanlines of said television signal;

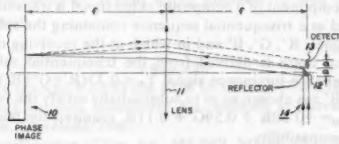
means responsive to the enabled sampling signal for sampling the television signal; and

means for converting the sampled television signal into digital form.

3,946,433
PHASE IMAGE SCANNING METHOD

Dorian Kermisch, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 25, 1974, Ser. No. 526,875
Int. Cl.² H04N 9/04
U.S. Cl. 358—41 42 Claims



1. A method of scanning a phase modulated image comprising the steps of:

a. providing a phase modulated image;

b. providing a lens means on-axis with the phase image one focal length thereof away from the phase image;

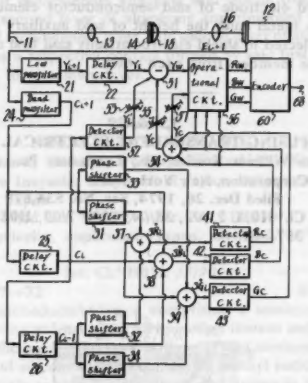
c. providing a deflector means on-axis with said lens means and the phase image, also one focal length away from said lens means, but on the opposite side thereof from the phase image, said deflector means pivotally and movably mounted to provide a scan path of the surface of the phase image;

d. directing a beam of collimated light from an off-axis location onto said deflector means whereby as the deflector means controls the scan path, the focused beam light illuminates the phase image.

3,946,434
COLOR TELEVISION CAMERA WITH LUMINANCE NON-UNIFORMITY COMPENSATION

Satoshi Shimada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 2, 1973, Ser. No. 412,269
Claims priority, application Japan, Nov. 9, 1973, 48-112305
Int. Cl.² H04N 9/07
U.S. Cl. 358—44 5 Claims



1. A color television camera for producing a composite video signal including chrominance and luminance signals, the latter having non-uniform characteristics, comprising an image pickup means, a color filter interposed optically between an object to be televised and said image pickup means for separating an image of said object into respective color components which are projected onto said image pickup means, means for deriving the luminance signal and the chrominance signal from said image pickup means, and means for substantially eliminating said non-uniform characteristics from the luminance signal, the last-mentioned means comprising means for detecting said chrominance signal to produce a luminance signal component in response thereto, means for adjusting the level of said produced luminance signal component, and means for subtracting the level adjusted luminance signal component from said luminance signal to thereby compensate said non-uniform characteristics.

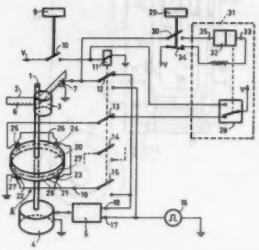
3,946,435
RECORDING AND PLAYBACK APPARATUS

Erich Langer, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 24, 1974, Ser. No. 491,560
Claims priority, application Austria, Aug. 1, 1973, 6773/73
Int. Cl.² H04N 5/78
U.S. Cl. 360—14 4 Claims

1. A synchronizing device for an apparatus for recording and playback video signals on a record carrier, comprising a drive shaft for moving the record carrier, a tachometer disc with a closed magnetizable track mounted on said drive shaft, an even number of equidistantly spaced interconnected magnetic heads around said closed magnetizable track, each succeeding magnetic head around said closed magnetizable track being oriented to magnetically polarize when energized the portion of the closed magnetizable track in the vicinity of said succeeding magnetic head in a direction opposite to the direction of a preceeding magnetic head of said interconnected magnetic heads, at least one of said interconnected magnetic

heads sensing said magnetic polarizations when in a non-energized state, switching means for selectively establishing a playback mode and a recording mode, synchronization head means for recording video vertical synchronization signals in a synchronization track on the record carrier and for reading said synchronization signals from said synchronization track, a servo system responsive to a reference input and a variable input for controlling the rotational speed of the drive shaft, a reference pulse source, said switching means comprising means for selectively connecting vertical synchronization pulses from a video signal to be recorded or said pulses from said reference pulse source to the reference input of the servo system in said playback mode depending on whether or not the video signal to be recorded is immediately to follow a previously recorded video signal on the record carrier, said



switching means further comprising means for connecting said synchronization signals read from said synchronization track to the variable input of said servo system and energizing said interconnected magnetic heads around said closed magnetizable track in said playback mode, said switching means also comprising means responsive to a concurrence of the selection of said recording mode and to the synchronization pulse read from the synchronization track following the selection of said recording mode for de-enerizing said interconnected magnetic heads around said closed magnetizable track, for connecting the synchronization pulses of the video signal to be recorded to the reference input of the servo system and for connecting said at least one of said magnetic heads sensing the polarization of said tachometer disc to said variable input of the servo system.

3,946,436

AUTOMATIC SHUTOFF MECHANISM FOR MAGNETIC TAPE RECORDING AND REPRODUCING APPARATUS

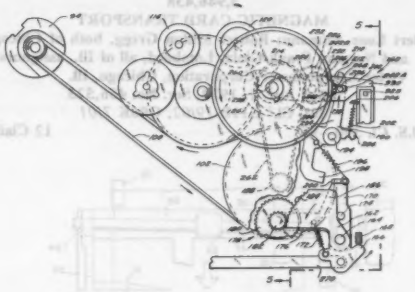
Shizuo Takashino, Ichikawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 6, 1974, Ser. No. 495,297

Int. Cl.[2] G11B *15/24;* B65H *59/38;* G03B *1/02*

U.S. Cl. 360—74 13 Claims

1. An apparatus operable in a plurality of modes, including play, stop, and rewind modes, for recording and/or reproducing signals on a magnetic tape extending between first and second reels to which the ends of the tape are secured and on which the tape is wound, said apparatus comprising: first and second rotatable reel support members for rotational coupling with the first and second reels, respectively; drive means; drive control means to effect operation of said drive means to operate said apparatus in any of said modes; transmission means connected to said drive means and comprising a first member driven in one direction by said drive means and further comprising means to couple said first member selectively to either of said reel support members for selectively driving the selected reel support member to rotate in the direction for winding tape on the reel respectively coupled therewith in response to operation of said drive means and permitting continued operation of said drive means when rotation of said reel support members is arrested upon the full unwinding of the tape from the other of said reels, said transmission means including means responsive to the drive control means for rotating one of said reel support members in said play mode and for interrupting the play mode and rewinding tape onto the reel coupled with the other of said reel support members, thereby to permit review of signals on tape wound on the reel coupled with said one reel support member during said play mode; shutoff means coupled to said first member of said transmission means to be powered by said drive means and having a first condition for causing said drive control means to halt the operation of said drive means and a second condition in which said drive means is unaffected by said shutoff means; and shutoff control means connected with one of said



reel support members for disposing said shutoff means in said second condition in response to rotation of said one reel support member and for disposing said shutoff means in said first condition in response to arresting of the rotation of said reel support members during continued operation of said drive means; and means responsive to said drive control means for preventing said shutoff control means from disposing the shutoff means in said first operative condition when said drive control means is actuated to cause said transmission means to rewind tape onto the reel coupled with the other of said reel support members during the play mode to permit signal review, whereby said tape can be fully rewound during the play mode without halting the operation of said drive means.

3,946,437

TAPE RECORDER WITH COUNTER DRIVE MECHANISM RESPONSIVE TO TAPE MOVEMENT

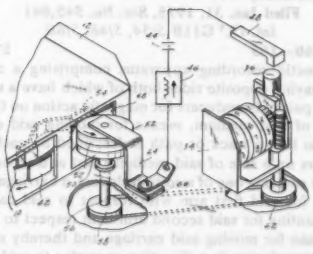
Ichiro Oro, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sept. 30, 1974, Ser. No. 510,641

Claims priority, application Japan, Dec. 4, 1973, 48-136618

Int. Cl.[2] G11B *27/14, 15/28, 19/06*

U.S. Cl. 360—79 3 Claims



1. In a tape recorder for use with a tape having an electrically conductive portion, said recorder being of the type having a tape drive mechanism, a resettable counter for indicating

the position of the tape, means for resetting the counter, and a power source, the improvement comprising movable means independent of the tape drive mechanism, said movable means abutting the tape and being driven by the movement of the tape, the counter being operatively connected to said movable means to be driven thereby, a pair of electrically isolated conductive strips situated on said moving means at the portion thereof abutting the tape, said counter resetting means being operatively connected to said power source through said conductive strips such that when said portion electrically connects said strips said counter resetting means is energized by said source.

3,946,438

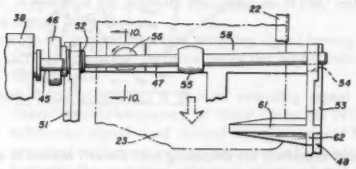
MAGNETIC CARD TRANSPORT

Bert Lane Altmann; Robert Milton Gregg, both of Chicago, and Norman Frank Gioia, Lombard, all of Ill., assignors to Victor Comptometer Corporation, Chicago, Ill.

Filed Apr. 1, 1974, Ser. No. 456,525

Int. Cl.² G11B *19/02*; G06K *7/01*

U.S. Cl. 360—88 **12 Claims**



1. A magnetic card transport, comprising a frame having curved guide means with an outer convex side and an inner concave side for receiving a flat flexible magnetic card for longitudinal translation relative thereto and flexing said card to a predetermined curvature, a magnetic head, means for mounting said head rigidly on said frame on the outer convex side of said guide means whereby effective low contact pressure with said card in said guide means as imposed solely by the latter and said flexed card, and card translating means for imparting longitudinal translation of said card relative to said guide means, which includes a driving roller, a shaft supporting said roller, a bracket supporting said shaft, means pivotally mounting said bracket on said frame and means for swinging said bracket from an inoperative position spaced from said card to an operative position engaging said driving roller with said card.

3,946,439

RECORDING APPARATUS FOR MAGNETIC DISKS USING BOTH SIDES OF THE DISK

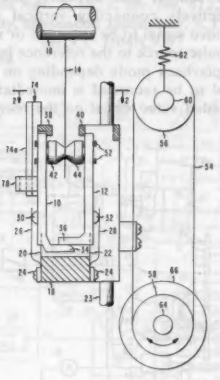
Daniel Owen Castrodale; Steven Gary Steele; William Stewart Wentink, and Stephen Edward Wheeler, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 31, 1975, Ser. No. 545,841

Int. Cl.² G11B *5/54, 5/48, 5/60*

U.S. Cl. 360—105 **11 Claims**

1. Magnetic recording apparatus comprising a magnetic medium having opposite sides both of which have a magnetic surface, a pair of transducers for magnetic action on the opposite sides of said medium, means for moving said magnetic medium so that a track or path is described by each of said transducers on a side of said medium, first and second swing arms each carrying one of said transducers, a carriage, a swing mounting for said first arm with respect to said carriage, a swing mounting for said second arm with respect to said carriage, means for moving said carriage and thereby said arms and said transducers in a direction at angles to said track so that the transducers traverse the magnetic medium on other tracks of the magnetic medium, an arm portion fixed with respect to said second swing arm adjacent to its swing mounting with said carriage and extending toward said first swing arm, and an arm portion fixed with respect to said first swing arm adjacent to its swing mounting with said carriage and extending toward said second swing arm to form a power transmitting connection with said arm portion of said second



swing arm so as to swing said second swing arm and said transducer carried thereby away from said medium when said first swing arm is swung about its swing mounting with said carriage to move said first swing arm and said transducer carried thereby away from said medium.

3,946,440

DUAL ERASING CORE STRUCTURE FOR SELECTIVELY ERASING ADJACENT RECORDING

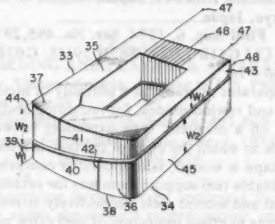
Takeshi Saito, Chichibu, Japan, assignor to Canon Kabushiki Kaisha and Canon Denshi Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 388,956, Aug. 16, 1973, abandoned. This application Dec. 3, 1974, Ser. No. 529,118

Claims priority, application Japan, Aug. 22, 1972, 47-98012[U]

Int. Cl.² G11B *5/12, 5/22*

U.S. Cl. 360—118 **8 Claims**



1. A combination erasing head for selectively erasing a plurality of tracks of a recording medium having parallel first and second tracks provided with a blank section interposed therebetween, comprising:

first and second erasing cores for the recording medium, said first erasing core having a first face engaging the recording medium including a portion extending across

the first track and one half of the blank section and having an end face formed in a single plane, said second erasing core having a first face engaging the recording medium including a portion extending across the second track and one half of the blank section and having an end face formed in a single plane, said end faces being parallel and opposed adjacent each other;

said first erasing core having only one erasing gap, said gap being provided in said portion of said first face and spanning the first track and substantially one half of the blank section;

said second erasing core having only one erasing gap, said gap being provided in said portion of said first face and spanning the second track and substantially one half of the blank section, said second erasing gap being spaced longitudinally from said first erasing gap.

DESIGN PATENTS

GRANTED MARCH 23, 1976

ERRATA

For CLASS	See PATENT NO.
008–232	239,258
035–003 A	239,297
034–015 C	239,309
032–001 R	239,310
054–004	239,318
056–004	239,339

DESIGNS

MARCH 23, 1976

239,215
TOASTER FRENCH FRY PRODUCT
James J. Miller, 189 Bartlett Ave., Toronto, Ontario M6H 3G2, Canada
Filed July 18, 1974, Ser. No. 489,541
Claims priority, application Canada Apr. 9, 1974
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—23

239,216
BONNET OR SIMILAR ARTICLE
Kee-Ock Kim and Hae-Chin Park, both of 2140 F St. NW., Washington, D.C. 20037
Filed Oct. 25, 1973, Ser. No. 409,462
Claims priority, application Republic of South Korea Sept. 6, 1973
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—239

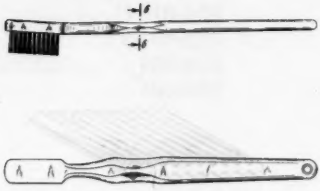
239,217
SPORTS SHOE
John David Lloyd, Toronto, Ontario, Canada, assignor to Pony Sporting Goods Limited, Markham, Ontario, Canada
Filed Apr. 26, 1974, Ser. No. 464,712
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310

239,218
SHIELD ATTACHABLE TO A HELMET
Willis C. Fortson, Mableton, Ga. (2651 Veracruse Court, Morrow, Ga. 30260)
Filed May 23, 1974, Ser. No. 472,548
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—233

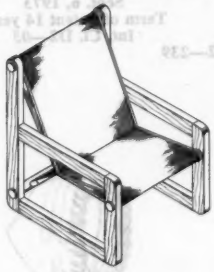
239,219
BELT
Joseph A. Burchard, Los Angeles, Calif. (5738 Whitsett, North Hollywood, Calif. 91607)
Filed Aug. 9, 1974, Ser. No. 496,060
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—389

239,220
WRIST SUPPORT
Bill Norman, 14431 Galy, Tustin, Calif. 92680 assignor to Master Industries, Inc., Irvine, Calif.
Filed Sept. 23, 1974, Ser. No. 508,437
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361

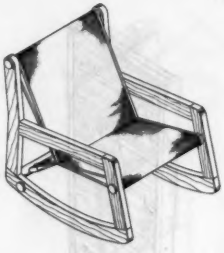
239,221
TOOTHBRUSH
Bernard Wasserman, 38 Rose Ave., Great Neck, N.Y. 11021
Filed Mar. 19, 1975, Ser. No. 559,849
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25



239,222
CHAIR
Dale D. Smith, Irvine, Calif., assignor to Samsonite Corporation, Denver, Colo.
Filed Jan. 12, 1974, Ser. No. 429,912
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69

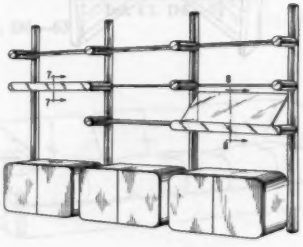


239,223
ROCKING CHAIR
Dale D. Smith, Irvine, Calif., assignor to Samsonite Corporation, Denver, Colo.
Filed Jan. 2, 1974, Ser. No. 430,169
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—49



239,224
COMBINED COSTUMER AND ACCESSORY HOLDER FOR A CHILD
Carol Guida, 423 S. 13th St., Philadelphia, Pa. 19147
Filed Jan. 16, 1974, Ser. No. 433,807
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—20

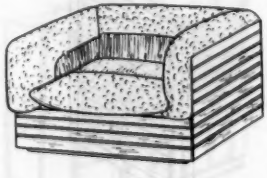
239,225
WALL SYSTEM
Janet Schweitzer, New York, N.Y., assignor to The Pace Collection, Inc., New York, N.Y.
Filed Jan. 25, 1974, Ser. No. 436,487
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—127



239,226
CHILD CARRIER FOR BICYCLE
John Peter Ronvik, Palos Heights, and Irvin E. Berger, Skokie, Ill., assignors to Sears, Roebuck and Co., Chicago, Ill.
Filed Feb. 4, 1974, Ser. No. 439,337
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—48

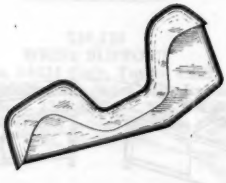
239,227
DESK
Franz Vogt, Pohlheim, Germany, assignor to Voko Franz Vogt & Co., Pohlheim, Germany
Filed Feb. 19, 1974, Ser. No. 443,837
Claims priority, application Germany Aug. 17, 1973
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—162

239,228
UPHOLSTERED SEAT
Victorio Introini, Gallarate, Italy, assignor to Fratelli Saporiti, Besnate, Parese, Italy
Filed Mar. 18, 1974, Ser. No. 452,412
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

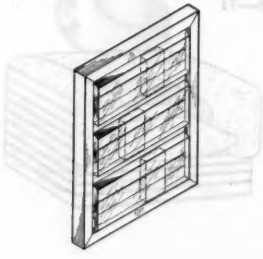


239,229
SPICE CHEST CABINET
Donald J. Booty, Frankfort, Ill., assignor to Amico, Inc., Philadelphia, Pa.
Filed Apr. 17, 1974, Ser. No. 461,680
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—129

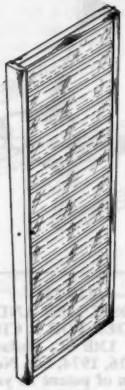
239,230
CHILD'S CAR SEAT
Hyman Wener, 482 94th Ave., Chomedey, Laval, Quebec, Canada
Filed Aug. 9, 1974, Ser. No. 496,055
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—9

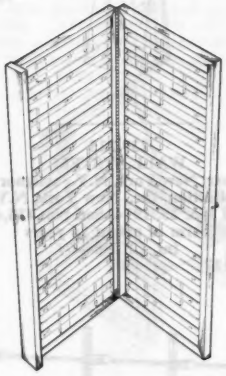


239,231
CASSETTE DISPLAY RACK
Michael D. Cockcroft, Larchmont, N.Y., assignor to Mar-Line Displays Inc., Port Chester, N.Y.
Filed Aug. 14, 1974, Ser. No. 497,235
Term of patent 14 years
Int. Cl. D6—*04*; D20—*02*
U.S. Cl. D6—157

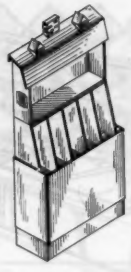


239,232
CASSETTE DISPLAY RACK
Michael D. Cockcroft, Larchmont, N.Y., assignor to Mar-Line Displays Inc., Port Chester, N.Y.
Filed Aug. 14, 1974, Ser. No. 497,236
Term of patent 14 years
Int. Cl. D6—*04*; D20—*02*
U.S. Cl. D6—172



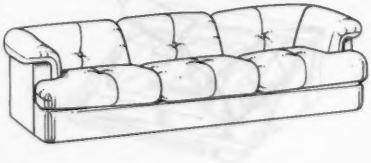


239,233
DISPLAY RACK OR THE LIKE
William E. Taylor, Middleburg Heights, Ohio, assignor to SCM Corporation, New York, N.Y.
Filed Aug. 26, 1974, Ser. No. 500,498
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—153

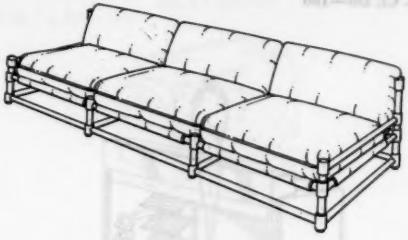


239,234
SKI SEAT
William L. Gamble, Unionville, and Richard H. Russell, Farmington, Conn., assignors to Industrial Design Consultants, Farmington, Conn.
Filed Sept. 19, 1974, Ser. No. 507,537
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47

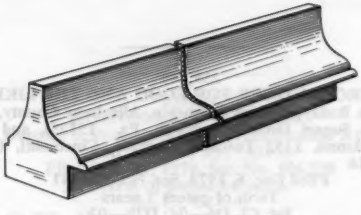
239,235
SEAT
David P. G. Williams, New York, N.Y., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed Oct. 1, 1974, Ser. No. 510,980
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



239,236
SOFA
Eugene J. Costabile, Oak Lawn, Ill., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed Nov. 13, 1974, Ser. No. 523,602
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—61



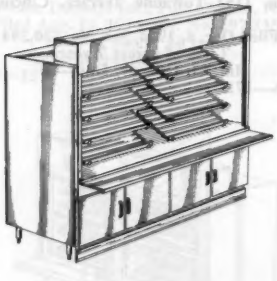
239,237
PICTURE FRAME MOULDING
Johannes Vihma, Toronto, Ontario, Canada, assignor to Artistic Woodwork Co. Ltd.
Filed Nov. 27, 1974, Ser. No. 527,647
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—246



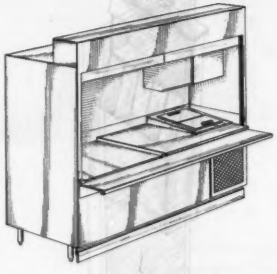
239,238
HOT FOOD MERCHANDISER
Eugene Buday, Wilkins Township, Allegheny County, Pa. (324 Sunset Drive, Pittsburgh, Pa. 15235), and Sol Blackman, 1152 Towanda Terrace, Cincinnati, Ohio 45216
Filed Dec. 6, 1974, Ser. No. 530,394
Term of patent 7 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—172

239,239
HOT BEVERAGE MERCHANDISER
Eugene Buday, Wilkins Township, Allegheny County, Pa. (324 Sunset Drive, Pittsburgh, Pa. 15235), and Sol Blackman, 1152 Towanda Terrace, Cincinnati, Ohio 45216
Filed Dec. 6, 1974, Ser. No. 530,440
Term of patent 7 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—168

239,240
MERCHANDISER FOR FOOD AND THE LIKE
Eugene Buday, Wilkins Township, Allegheny County, Pa. (324 Sunset Drive, Pittsburgh, Pa. 15235), and Sol Blackman, 1152 Towanda Terrace, Cincinnati, Ohio 45216
Filed Dec. 6, 1974, Ser. No. 530,441
Term of patent 7 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—168

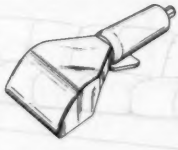


239,241
COMBINED COLD BEVERAGE AND FROZEN FOOD MERCHANDISER
Eugene Buday, Wilkins Township, Allegheny County, Pa. (324 Sunset Drive, Pittsburgh, Pa. 15235), and Sol Blackman, 1152 Towanda Terrace, Cincinnati, Ohio 45216
Filed Dec. 6, 1974, Ser. No. 530,442
Term of patent 7 years
Int. Cl. D20—*02*
U.S. Cl. D6—187

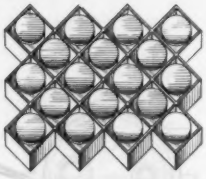


239,242
DISPLAY CASE
Bertram H. Kapnek, 8106 Douglas Road, Philadelphia, Pa. 19118
Filed Apr. 16, 1975, Ser. No. 568,647
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—168

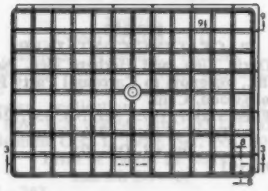
239,243
HAND TOOL FOR CLEANING FABRIC
William Hachtmann, Santa Barbara, Calif., and Arlen M. Knight, 3943 Laguna Blanca, Santa Barbara, Calif. 93110; said Hachtmann assignor to said Knight
Filed May 12, 1975, Ser. No. 576,610
Term of patent 14 years
Int. Cl. D7—*05;* D15—*05*
U.S. Cl. D7—161



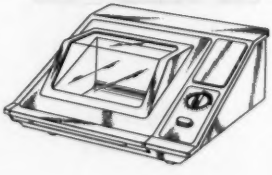
239,244
COMBINED SPICE RACK AND BOTTLES THEREFOR
Reiner Lubge, New York, N.Y., assignor to Lubalin, Smith, Carnase, Inc., New York, N.Y.
Filed July 25, 1972, Ser. No. 275,000
Term of patent 14 years
Int. Cl. D6—*04;* D7—*02*
U.S. Cl. D7—71



239,245
COUNTER MAT
Alfred William Fletcher, Wirral, England, assignor to The Moreton Engineering Company Limited, Liverpool, England
Filed June 29, 1973, Ser. No. 374,998
Claims priority, application Great Britain Jan. 4, 1973
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—188



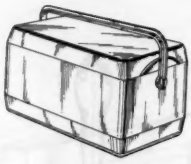
239,246
MICROWAVE OVEN
Yoshiaki Kawata, Nara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan
Filed May 15, 1974, Ser. No. 470,100
Claims priority, application Japan Nov. 20, 1973
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128



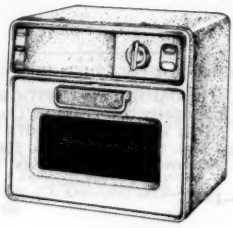
239,247
SPOON OR SIMILAR ARTICLE
Frank R. Perry, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed June 14, 1974, Ser. No. 479,209
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

239,248
AUTOMOBILE CUSPIDOR
Douglas B. Pinguely, 1314 N. Fort Thomas Ave., Fort Thomas, Ky. 41075
Filed Sept. 17, 1974, Ser. No. 506,798
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—190

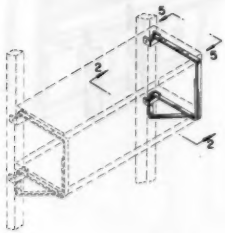
239,249
INSULATED FOOD CONTAINER
Tony E. Branscum, Winfield, Kans., assignor to Gott Manufacturing Co., Inc.
Filed Oct. 15, 1974, Ser. No. 514,832
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—77



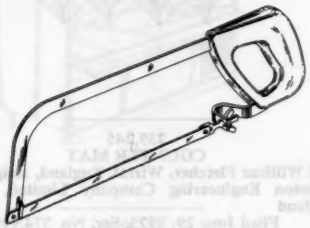
239,250
MICROWAVE OVEN
Yoshiaki Kawata and Daisaku Mori, Nara, and Yuzo Fujii and Michio Tanaka, Yamato-Koriyama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed Dec. 16, 1974, Ser. No. 533,445
Claims priority, application Japan June 20, 1974
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128



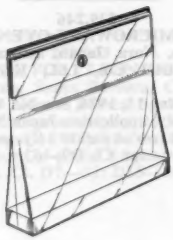
239,251
SUPPORT BRACKET
James Frederick Sheetz, 3177 W. Westhaven Drive, Anaheim, Calif. 92804
Filed June 21, 1973, Ser. No. 372,157
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—242



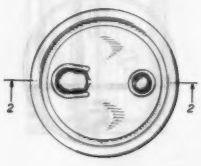
239,252
HACKSAW
Laird F. Covey, Easton, and George W. Merrow, Bloomfield, Conn., assignors to The Stanley Works, New Britain, Conn.
Filed Aug. 8, 1973, Ser. No. 386,597
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—96



239,253
PACKAGING CONTAINER
Joe Tiep, Darin Tiep, and Herbert Tiep, North Hollywood Calif., assignors to Carrousel Party Favors, Inc., North Hollywood, Calif.
Filed May 7, 1973, Ser. No. 357,724
Term of patent 3½ years
Int. Cl. D9—*03*
U.S. Cl. D9—191



239,254
CONTAINER END
Richard J. Brincks, Wheeling, William L. Fox, Jr., Libertyville, and Henry S. Holc, Barrington, Ill., assignors to American Can Company
Original design application Aug. 10, 1972, Ser. No. 279,308, now U.S. Patent No. 233,137. Divided and this application Oct. 1, 1973, Ser. No. 402,598
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—253

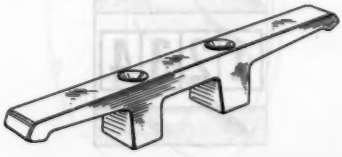


239,255
CONTAINER END
Richard J. Brincks, Wheeling, William L. Fox, Jr., Libertyville, and Henry S. Holc, Barrington, Ill., assignors to American Can Company
Original design application Aug. 10, 1972, Ser. No. 279,308, now U.S. Patent No. 233,137. Divided and this application Oct. 1, 1973, Ser. No. 402,599
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—253

239,256
CONTAINER END
Richard J. Brincks, Wheeling, William L. Fox, Jr., Libertyville, and Henry S. Holc, Barrington, Ill., assignors to American Can Company
Original design application Aug. 10, 1972, Ser. No. 279,308, now U.S. Patent No. 233,137. Divided and this application Oct. 1, 1973, Ser. No. 402,600
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—253

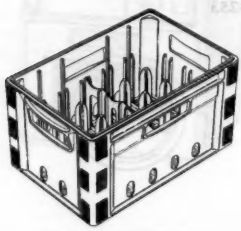
239,257
CONTAINER END
Alfred Edward Balocca, Wheaton; Paul Wilson Hardy, Barrington, and Karl Philip Hemeyer, and Harlen Edgar Wilkinson, Crystal Lake, Ill., assignors to American Can Company
Filed Mar. 18, 1974, Ser. No. 452,129
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—253

239,258
CLEAT
Thomas L. Faul, 79 Scollard St., M5R 1G4, Toronto, Ontario, Canada
Filed Apr. 7, 1975, Ser. No. 565,735
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—232



239,259
BOTTLE OR THE LIKE
Hans-Peter Ming, Wolfhausen, and Edward Hubbard Yonkers, Pfaffhausen, Switzerland, assignors to Sika AG, Zurich, Switzerland
Filed Aug. 13, 1973, Ser. No. 388,022
Claims priority, application Switzerland Feb. 19, 1973
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—38

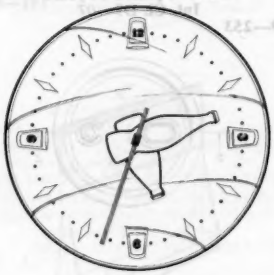
239,260
CRATE FOR BEVERAGE CONTAINERS OR THE LIKE
Philip David Gale, Romford, England, assignor to John Dale Limited
Filed July 1, 1974, Ser. No. 485,033
Claims priority, application Great Britain Jan. 23, 1974
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—177



239,261
THERMOCHROMIC THERMOMETER
Philip L. Van Kersen, P.O. Box 40423, Indianapolis, Ind. 46240
Filed Nov. 12, 1973, Ser. No. 414,744
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57

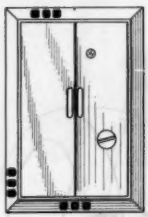
239,262
THERMOCHROMIC ADHESIVE THERMOMETER
Philip L. Van Kersen, P.O. Box 40423, Indianapolis, Ind. 46240
Filed Nov. 12, 1973, Ser. No. 414,745
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57

239,263
COMBINED CLOCKFACE AND HANDS THEREFOR
Ke Won Lee, P.O. Box 2832, Hialeah, Fla. 33012
Filed June 6, 1974, Ser. No. 476,922
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—124

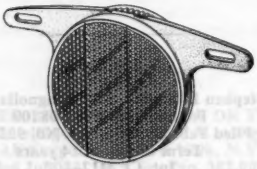


239,264
WITHDRAWN

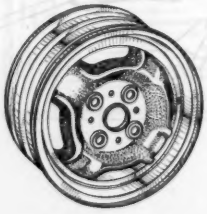
239,265
SMOKE DETECTOR
Charles Berns, New Milford, and Rudolph M. Duris, Norwalk, Conn., assignors to General Signal Corporation
Filed Aug. 8, 1974, Ser. No. 495,616
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



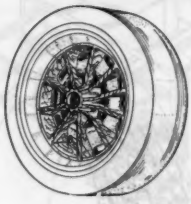
239,266
REFLECTOR
Yosimasa Tsuyama, Higash Sumiyoshi-ku, Osaka, Japan, assignor to Tsuyama Mfg. Co., Ltd., Higashi Sumiyoshi-ku, Osaka, Japan
Filed Nov. 21, 1974, Ser. No. 525,805
Claims priority, application Japan Sept. 19, 1974
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111



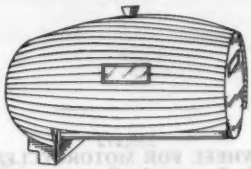
239,267
WHEEL
Millard Fillmore Harty, Jr., 4881 Kensington Road, Bloomfield Hills, Mich. 48013
Filed Sept. 22, 1972, Ser. No. 291,304
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209



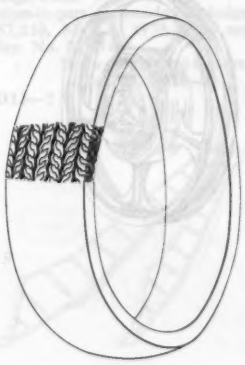
239,268
COMBINED WHEEL AND TIRE
Millard Fillmore Harty, Jr., Bloomfield Hills, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.
Continuation-in-part of abandoned design application Ser. No. 140,014, May 3, 1971. This application July 20, 1973, Ser. No. 381,177
Term of patent 14 years
Int. Cl. D12—*15;* D12—*16*
U.S. Cl. D12—135



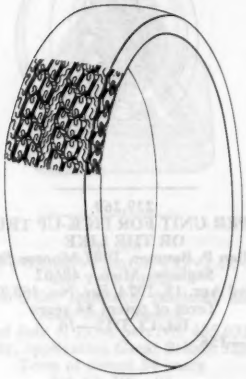
239,269
CAMPER UNIT FOR PICK-UP TRUCKS OR THE LIKE
Allen P. Baumer, 1007 Monroe St., Saginaw, Mich. 48602
Filed Apr. 15, 1974, Ser. No. 460,705
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



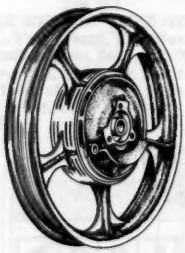
239,270
PNEUMATIC TIRE TREAD AND BUTTRESS
Carl F. Smajd, Shores, and Arthur C. Blankenship, Howell, Mich., assignors to Uniroyal, Inc.
Filed Nov. 4, 1974, Ser. No. 520,340
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142



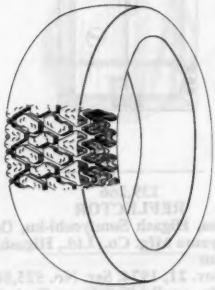
239,271
PNEUMATIC TIRE TREAD AND BUTTRESS
Allen D. Turner, Saint Clair Shores, Mich., assignor to Uniroyal, Inc.
Filed Nov. 18, 1974, Ser. No. 524,598
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



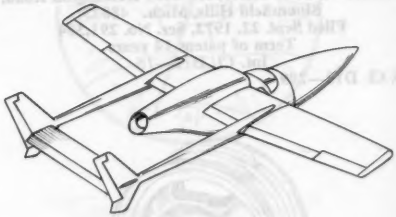
239,272
WHEEL FOR MOTORCYCLES
Tullio Campagnolo, Corso Padova, 168, 36100 Vicenza, Italy
Filed Feb. 3, 1975, Ser. No. 546,448
Claims priority, application Italy Aug. 2, 1974
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D12—205



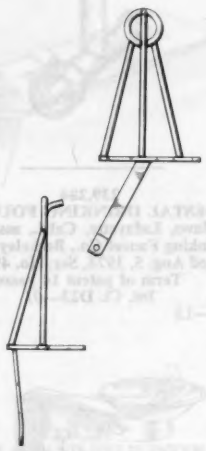
239,273
PNEUMATIC TIRE TREAD AND BUTTRESS
Gerhard Franz-Josef Senger, Aachen, Germany, assignor to Uniroyal, Inc.
Filed Feb. 24, 1975, Ser. No. 552,081
Claims priority, application Germany Sept. 25, 1974
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—136



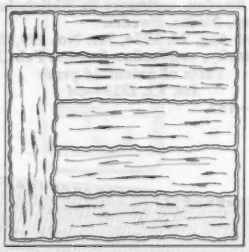
239,274
AIRCRAFT
Stephen L. Snyder, 5801 Magnolia Ave., Pennsauken, N.J. 08109
Filed Feb. 25, 1975, Ser. No. 552,790
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—76



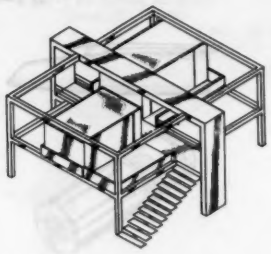
239,275
TOW LINE HITCH FOR WATER SKI
Morris Fink, 4857 W. 131 St., Hawthorne, Calif. 90250
Filed Mar. 27, 1975, Ser. No. 562,640
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D12—162



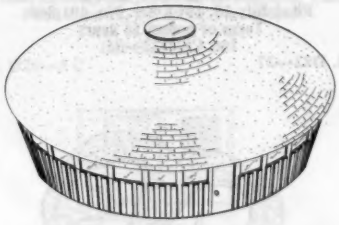
239,276
SIMULATED BRICK STRUCTURE OR THE LIKE
Bruce Terwilliger, Newburgh, N.Y., assignor to GAF Corporation, New York, N.Y.
Filed July 23, 1973, Ser. No. 382,002
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 J



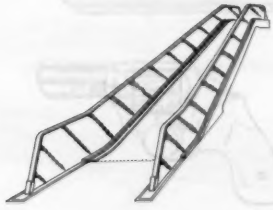
239,277
BUILDING STRUCTURE
Kreso Forgiarini, 2998 N. Lake Ave., Altadena, Calif. 91001
Filed May 30, 1974, Ser. No. 474,516
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 B



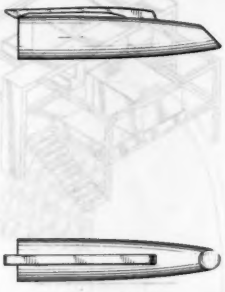
239,278
YURT OR SIMILAR ARTICLE
William S. Coperthwaite, Bucks Harbor, Maine 04618
Filed June 6, 1974, Ser. No. 476,881
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 E



239,279
PAIR OF BALUSTRADES FOR PASSENGER CONVEYORS
Ernest D. Johnson, Tallmadge, and Charles W. Roberts, Akron, Ohio, assignors to Westmont Industries, Santa Fe Springs, Calif.
Continuation-in-part of abandoned design application Ser. No. 357,230, May 4, 1973. This application Oct. 3, 1974, Ser. No. 511,744
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D13—7 R



239,280
WRITING PEN CAP
Guy A. Taylor, Batavia, Ill., assignor to Sanford Research Company, Bellwood, Ill.
Filed Aug. 8, 1973, Ser. No. 386,512
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—57

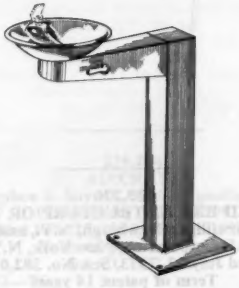


239,281
PLASTIC ARTIFICIAL FISHING LURE
William O. Williams, Jr., 1309 Lynhurst Drive, Gastonia, N.C. 28052
Filed July 25, 1974, Ser. No. 491,860
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

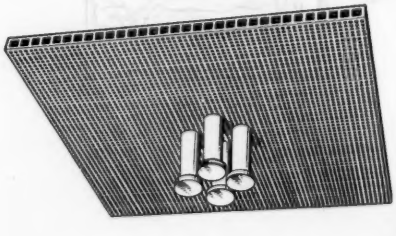
239,282
REVOLVER
Ralph C. Kennedy, South Windsor, and Richard L. Baker, Wallingford, Conn., assignors to The Leisure Group, Inc.
Filed Aug. 12, 1974, Ser. No. 496,756
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—1

239,283
VALVE HOUSING
Frank K. Villari, Oak Park, Ill., assignor to The Kendall Company, Walpole, Mass.
Filed July 8, 1974, Ser. No. 486,511
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

239,284
PEDESTAL DRINKING FOUNTAIN
Terry R. Haws, Lafayette, Calif., assignor to Haws Drinking Faucet Co., Berkeley, Calif.
Filed Aug. 5, 1974, Ser. No. 494,397
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—13



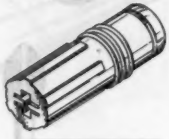
239,285
ADJUSTABLE AIR OUTLET UNIT
Birger Lärkfeldt, Odemsjo-Barnapp, and Lennart Widerby, Jonkoping, Sweden, assignors to Aktiebolaget Svenska Fläktfabriken, Nacka, Sweden
Filed Aug. 22, 1974, Ser. No. 499,860
Claims priority, application Sweden Feb. 25, 1974
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—163



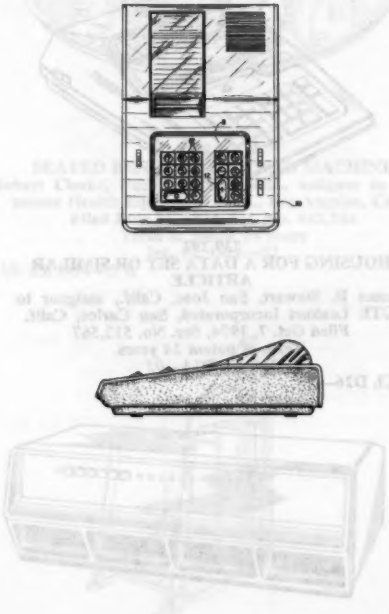
239,286
AIR BRUSH HOLDER OR SIMILAR ARTICLE
Dallas R. Bottcher, 911 Cobblestone Drive, Lincoln, Nebr. 68510
Filed Dec. 12, 1974, Ser. No. 532,254
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—167

239,287
CASING FOR A HAND-HELD INTERACTIVE COMPUTER TERMINAL
Charles Michael Ault, 11 Devereaux St., Arlington, Mass. 02174
Filed Mar. 11, 1974, Ser. No. 449,680
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

239,288
SOCKET ASSEMBLY FOR A MINIATURE DECORATIVE LIGHT BULB
Joseph M. Ahroni, P.O. Box 3907, Seattle, Wash. 98124
Filed Apr. 26, 1974, Ser. No. 464,434
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 G



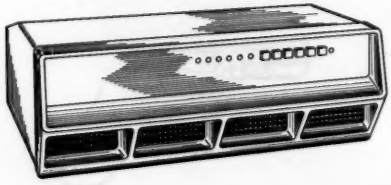
239,289
THERMAL PRINTER
Lawrence Glen McCain, Beverly Hills, and Edward William Scott, Culver City, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.
Filed June 12, 1974, Ser. No. 478,557
Term of patent 7 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C



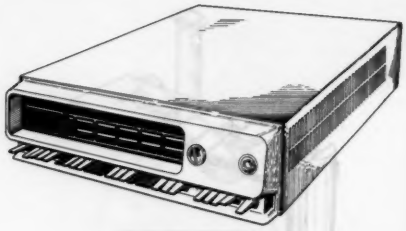
239,290
MICROPHONE
Hiroshi Saito, Kazuyoshi Kojima, and Hisatoshi Matsushima, Yokohama-shi, Kanagawa, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan
Filed June 18, 1974, Ser. No. 480,330
Claims priority, application Japan Dec. 18, 1973
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 J

239,291
ELECTRONIC CALCULATING MACHINE
Shigeru Kurozumi, Osaka, Japan, assignor to Sharp Kabushiki Kaisha (Sharp Corporation), Osaka, Japan
Filed June 24, 1974, Ser. No. 481,983
Claims priority, application Japan Dec. 27, 1973
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

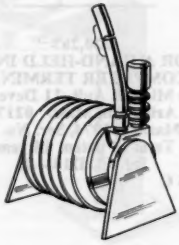
239,292
HOUSING FOR A DATA SET OR SIMILAR ARTICLE
James R. Stewart, San Jose, Calif., assignor to GTE Lenkurt Incorporated, San Carlos, Calif.
Filed Oct. 7, 1974, Ser. No. 512,567
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



239,293
COMPUTER OR SIMILAR ARTICLE
John Warren Carroll, III, Pepperell, Mass., assignor to Data General Corporation, Southboro, Mass.
Filed Nov. 7, 1974, Ser. No. 521,814
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



239,294
BELLOWS SMOKING PIPE
Glenn Thomas Cathey, 1106 E. Saginaw, Lansing, Mich. 48906
Filed May 2, 1974, Ser. No. 466,236
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—3



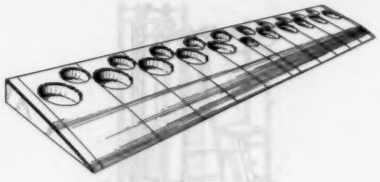
239,295
CONCRETE FENCE PANEL
Earle T. Dougherty, 3420 N. 71st Ave., Phoenix, Ariz. 85033
Filed Sept. 4, 1973, Ser. No. 394,068
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D28—4 A

239,296
COIN
John P. Johnston, P.O. Box 6008, Tamuning, Guam 96911
Filed Dec. 17, 1973, Ser. No. 425,214
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—19 R

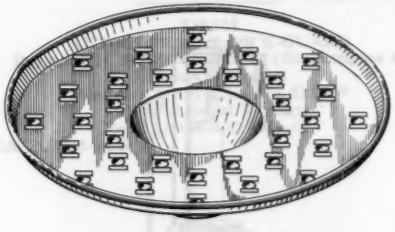
239,297
FLOWER HOLDER
Elmer F. St. Amand, North Hollywood, Calif., assignor to Fred A. Stewart, Inc., San Gabriel, Calif.
Filed Mar. 28, 1974, Ser. No. 455,539
Term of patent 7 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A

239,298
FINGER RING CUE CHALK HOLDER
Don L. Turner, Morganfijoreg, Westfield, Wis. 53964
Filed Feb. 22, 1974, Ser. No. 444,701
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—3

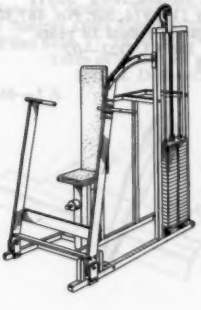
239,299
GOLF BALL PUTTING GAME TARGET
John Joseph O'Shea, Cloneeven, Dublin Road, Sutton, Ireland
Filed Apr. 29, 1974, Ser. No. 465,277
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D34—5 NN



239,300
POCKETED BALL GAME BOARD OR SIMILAR ARTICLE
Raymond W. Baker, 596 Bishop Ave., Bridgeport, Conn. 06610
Filed May 28, 1974, Ser. No. 473,776
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 TT

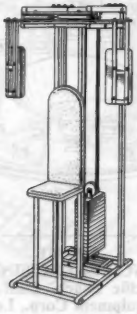


239,301
SEATED BENCH EXERCISING MACHINE
Robert Clarke, Pacific Beach, Calif., assignor to Paramount Health Equipment Corp., Los Angeles, Calif.
Filed June 24, 1974, Ser. No. 482,344
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 K



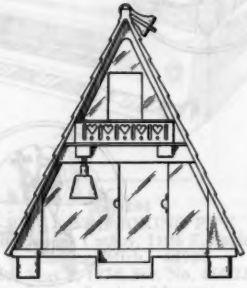
239,302
TRICEP EXERCISING MACHINE
Robert Clarke, Pacific Beach, Calif., assignor to Paramount Health Equipment Corp., Los Angeles, Calif.
Filed June 24, 1974, Ser. No. 482,345
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 K

239,303
VERTICAL BUTTERFLY EXERCISING MACHINE
Robert Clarke, Pacific Beach, Calif., assignor to Paramount Health Equipment Corp., Los Angeles, Calif.
Filed June 24, 1974, Ser. No. 482,346
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 K

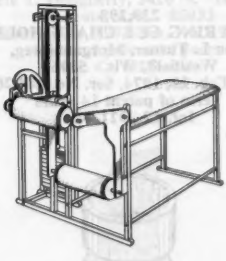


239,304
DIVOT REPLACEMENT TOOL
Albert P. Jackson, 6521 Washington St., Des Moines, Iowa 50311
Filed July 11, 1974, Ser. No. 487,388
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB

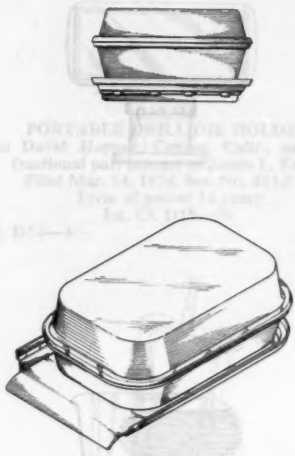
239,305
TOY HOUSE
Ronald J. Campanell, Blackwood, N.J., and Walter P. Doe, East Aurora, N.Y., assignors to The Quaker Oats Company, Chicago, Ill.
Filed July 29, 1974, Ser. No. 492,494
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL



239,306
LEG CURL EXERCISING MACHINE
Robert Clarke, Pacific Beach, Calif., assignor to Paramount Health Equipment Corp, Los Angeles, Calif.
Filed Aug. 13, 1974, Ser. No. 496,941
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 K

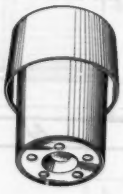


239,307
SEED SPROUTER ASSEMBLY
George M. Sawyer, 8801 Calico Ave., Garden Grove, Calif. 92641
Filed Nov. 1, 1974, Ser. No. 520,111
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A



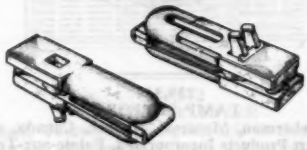
239,308
FLOWER POT
Rodney Dennis Bufton, by the Lucas Electrical Company Ltd., Birmingham, England, assignee
Original No. Des. 233,058, dated Oct. 1, 1974, Ser. No. 372,100, June 21, 1973. Application for reissue May 13, 1975, Ser. No. 577,084
Claims priority, application Great Britain Dec. 21, 1972
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

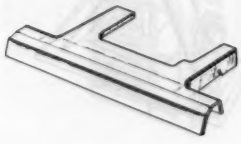


239,309
TOY GUITAR
Paolo Bontempi, Via Don Bosco 49, Potenza Picena, Macerata, Italy
Filed June 13, 1973, Ser. No. 369,649
Claims priority, application Italy Dec. 13, 1972
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 C

239,310
AUTOCLAVABLE PICK-GUARD
Raymond H. Haerr, Cincinnati, Ohio, assignor to Xomox Corporation
Filed Nov. 8, 1974, Ser. No. 522,199
Term of patent 14 years
Int. Cl. D24—*02*; D8—*08*
U.S. Cl. D32—1 R

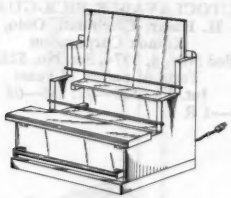


239,311
COG COVER FOR SELF-PROPELLED ROTARY LAWNMOWER
Larry Monroe Cognata, Nashville, Tenn., assignor to The Murray Ohio Manufacturing Company
Filed Sept. 17, 1974, Ser. No. 506,851
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 A

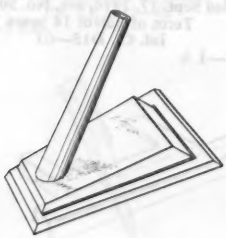


239,312
RING
William L. Foreman, 123 Las Vegas, Orinda, Calif. 94563
Filed Dec. 6, 1974, Ser. No. 530,327
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10 A

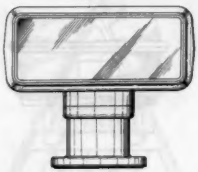
239,313
COMBINED MINIATURE BAR AND NIGHT LAMP
Joseph T. Benway (614 Hyde Park Ave., Hyde Park, Boston, Mass. 02136)
Filed May 24, 1974, Ser. No. 473,070
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 D

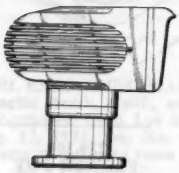


239,314
LAMP SUPPORT
Gilbert Lieberman, Montreal, Quebec, Canada, assignor to Gilbert Products Incorporated, Pointe-aux-Trembles, Quebec, Canada
Filed July 1, 1974, Ser. No. 484,796
Claims priority, application Canada May 15, 1974
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 F



239,315
SEARCHLIGHT
Taiji Satoh, Koshigaya-shi, Saitama-Ken, and Masaaki Ishii, Tokyo, Japan, assignors to Sanshin Dengu Manufacturing Co., Ltd., Tokyo, Japan
Filed Sept. 11, 1974, Ser. No. 504,897
Claims priority, application Japan June 28, 1974
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—20 K



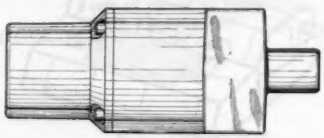


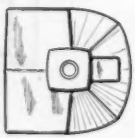
239,316
DISPENSING TRAY FOR PLASTIC BAGS OR THE LIKE
Kenneth A. Smith, 6520 SE. 77th Ave., Portland, Oreg. 97206
Filed Nov. 20 ,1972, Ser. No. 308,229
Term of patent 14 years
The portion of the term of the patent subsequent to Apr. 11, 1986, has been disclaimed
Int. Cl. D9—*99*
U.S. Cl. D52—2 C

239,317
WOOD PLANER CUTTER HEAD WITH REMOVABLE BITS
Jesse L. Spencer, Jr., 2401 Ellington St., and John S. Stewart, 2004 Cedarfork Drive, both of Greensboro, N.C. 27403
Filed Sept. 23, 1974, Ser. No. 508,093
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D55—1 A

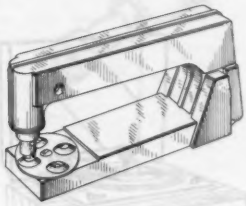
239,318
PORTABLE DRILL DIE HOLDER
Norman David Hopper, Covina, Calif., assignor of a fractional part interest to James L. Enloe
Filed Mar. 14, 1974, Ser. No. 451,020
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D54—4

239,319
ROTARY ACTUATOR
Stephen Matousek, and Ulrich H. Koch, Moraga, Calif., assignors to Whitey Research Tool Co., Emeryville, Calif.
Filed May 19, 1975, Ser. No. 578,758
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1 G

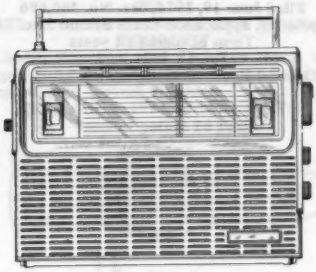




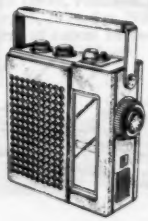
239,320
APPARATUS FOR ATTACHING ORNAMENTS TO SHEET MATERIAL
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011
Filed Mar. 12, 1975, Ser. No. 557,788
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D55—1 R



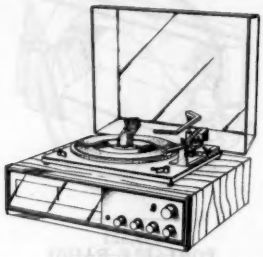
239,321
PORTABLE RADIO
Paul J. Klucznik, Manlius, N.Y., assignor to General Electric Company, Syracuse, N.Y.
Filed Jan. 7, 1974, Ser. No. 431,378
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



239,322
RADIO RECEIVER
Kazumasa Takenaka, Moriguchi-shi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan
Filed Apr. 18, 1974, Ser. No. 462,068
Claims priority, application Japan, Oct. 22, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

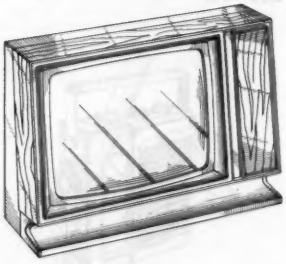


239,323
COMBINED RECORD PLAYER RECEIVER AND AMPLIFIER
Toshimasa Akazawa, Yao, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed May 7, 1974, Ser. No. 467,842
Claims priority, application Japan Nov. 12, 1973
Term of patent 14 years
Int. Cl. D14—*01;* D14—*03*
U.S. Cl. D56—4 R

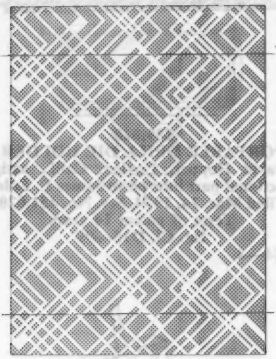


239,324
WRIST RADIO
Hoi Tong Vong, Hong Kong, assignor to Asia International, Hong Kong
Filed June 19, 1974, Ser. No. 480,696
Claims priority, application Great Britain Dec. 21, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

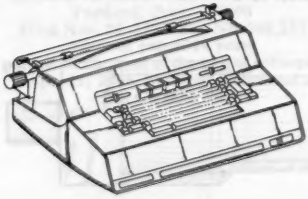
239,325
TELEVISION RECEIVER
Melvin H. Boldt, Glenview, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.
Filed Oct. 2, 1973, Ser. No. 402,874
Term of patent 7 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 D



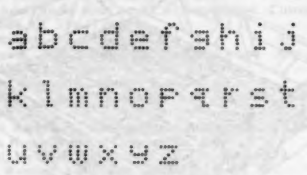
239,326
PAPER TOWELING
Donald T. Appleman, Cincinnati, Ohio, assignor to The Procter & Gamble Company
Filed June 19, 1974, Ser. No. 480,642
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D59—2 A



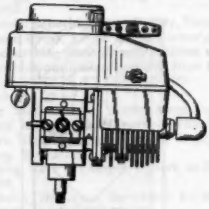
239,327
TYPEWRITER
Richard Authier, Lausanne, Switzerland, assignor to Paillard S.A., Sainte-Croix, Paud, Switzerland
Filed July 25, 1973, Ser. No. 382,549
Claims priority, application Switzerland Feb. 8, 1973
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A



239,328
COMPUTER INPUT OUTPUT LOWER CASE ALPHA TYPE FONT
Michael Arnold Bromberg, Boston, Mass., assignor to Termiflex Corporation, Nashua, N.H.
Filed Mar. 11, 1974, Ser. No. 449,637
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D64—12 B

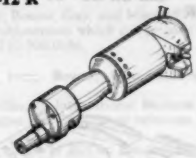


239,329
INTERNAL COMBUSTION ENGINE
Buford J. Schramm, 14805 S. Interstate 10, Tempe, Ariz. 85281, and Robert G. Everts, 2118 E. Burchwood Ave., Mesa, Ariz. 85204
Filed Oct. 23, 1974, Ser. No. 517,293
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D77—1 R

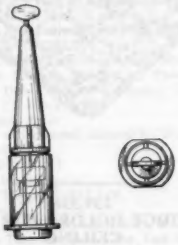


239,330
VENTILATION TUBE FOR MYRINGOTOMY OPERATIONS
John J. Shea, Jr., Memphis, Tenn., assignor to Richards Manufacturing Company, Inc., Memphis, Tenn.
Filed Dec. 5, 1973, Ser. No. 421,912
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—12 A

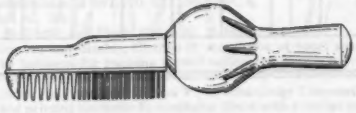
239,331
CAST CUTTER
Harry T. Treace, Forest Hill, Tenn., assignor to Richards Manufacturing Company, Inc., Memphis, Tenn.
Filed May 8, 1974, Ser. No. 468,094
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12 R



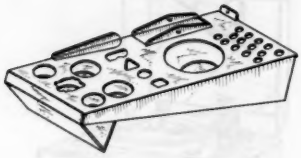
239,332
DEVICE FOR ADMINISTERING A BIOLOGICAL PRODUCT
Willy Lhoest, Rixensart, and Eloi Van Hoye, Weert-St.-Georges, Belgium, assignors to Recherche et Industrie Therapeutiques, Genval, Belgium
Filed Aug. 2, 1974, Ser. No. 493,879
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12 A



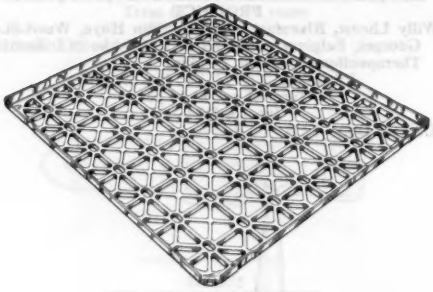
239,333
HAIR GEL DISPENSING COMB
Gladys M. Guinette, Sandy, Oreg. (7631 SE. 190th Drive, Portland, Oreg. 97236)
Filed Nov. 15, 1974, Ser. No. 523,972
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—8



239,334
HOLDER FOR GRAPHIC DESIGNER'S TOOLS OR THE LIKE
Martin Lowenstein, 463 West St., Apt. H-597 New York, N.Y. 10014
Filed Sept. 24, 1973, Ser. No. 400,234
Term of patent 3½ years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R

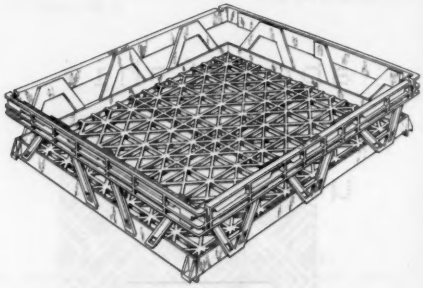


239,335
BAKERY TRAY OR THE LIKE
Lewis T. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Dec. 26, 1973, Ser. No. 428,426
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



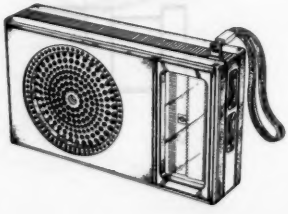
239,336
TAPE CARTRIDGE HOLDER FOR AUTOMOBILE CEILING
Albert A. Urie, 1410 Morrison Road, Canon City, Colo. 81212
Filed Sept. 27, 1973, Ser. No. 401,368
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 D

239,337
BAKERY TRAY OR THE LIKE
Lewis T. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Jan. 17, 1974, Ser. No. 434,005
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



239,338
TWO-WAY FIRE EXTINGUISHER LOCATOR SIGN
Roman Christman, Larry Christman, and Ricky Christman, all of 1516 N. 3rd St., St. Cloud, Minn.
Filed Oct. 24, 1974, Ser. No. 518,381
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R

239,339
RADIO RECEIVER
Masanori Hamada, Moriguchi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed Oct. 15, 1974, Ser. No. 515,040
Claims priority, application Japan Apr. 19, 1974
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



INDEX OF APPLICANTS AND ASSIGNEES

OF

PATENT APPLICATIONS PUBLISHED ON THE 23RD DAY OF MARCH, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Agfa-Gevaert, N.V.: *See—*
Pollet, Robert Joseph; Vandeputte, Camille Angelina; Sels, Francis Jeanne; Vanreusel, Gerard Laurens; Willems, Jozef Frans; and van Veelen, George Frans, B 417,498.

Ahmed, Adel Abdel Aziz, to RCA Corporation. Current amplifier. B 531,686, Cl. 330-17.000.

Aiba, Masahiko: *See—*
Fujimoto, Isao; Kasubuchi, Takeshi; and Aiba, Masahiko, B 450,413.

American Cyanamid Company: *See—*
Castellion, George Augustus; and Marzluff, William Frank, B 159,570.
Fogel, Arnold W.; and Mercurio, Anthony F., B 438,048.

American Home Products Corporation: *See—*
Freed, Meier E.; and Potoski, John R., B 421,373.
Kao, Wenling; and Strike, Donald P., B 491,711.
Strike, Donald P.; and Kao, Wen-Ling, B 494,138.

AMP Incorporated: *See—*
Moser, Jesse Lee; Reavis, Robert Philmore, Jr.; and Soderstrom, Melvin Andrew, B 523,952.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Berkel, Wilhelm; and Gettert, Hans, B 456,905.

Barkhuff, Earl D.; Borm, David S.; McGinnis, Bernard W.; and Rosenlund, Bertel E., to International Business Machines Corp. Random access disk file with axial translation of disks and end plate. B 484,482, Cl. 360-98.000.

BASF Aktiengesellschaft: *See—*
Beyer, Karl-Heinz; Wulz, Klaus; and Kindscher, Wolfgang, B 409,310.
Diessel, Paul; Helfert, Herbert; Hamm, Reiner; and Scharpenberg, Hans-Georg, B 530,303.
Fischer, Martin; Quadbeck-Seeger, Hans-Juergen; Kilpper, Gerhard; Schecker, Hans-Georg; and Koehler, Waldemar, B 354,222.
Greif, Norbert; Vescia, Michele; Daeuble, Manfred; and Heinrich, Hans, B 497,571.
Volkert, Otto; Wigger, August; Zuerger, Manfred; and Richter, Peter, B 421,608.
Wolf, Dieter; Bender, Eberhard; and Weber, Theodor, B 466,304.

Batha, Howard D.; and Cross, Leslie E., to Carborundum Company, The. Process for generating periodic non-uniform electric field, and for removing polarizable particulate material from fluid, using ferroelectric apparatus. B 589,179, Cl. 204-186.000.

Bayer Aktiengesellschaft: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Hammann, Ingeborg; and Stendel, Wilhelm, B 498,288.
Kuhle, Engelbert; Siegle, Peter; Behrenz, Wolfgang; and Hammann, Ingeborg, B 483,746.
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, B 459,408.
Sirrenberg, Wilhelm; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, B 510,836.
Wolfrum, Gerhard; and Gold, Heinrich, B 591,141.

Behrenz, Wolfgang: *See—*
Kuhle, Engelbert; Siegle, Peter; Behrenz, Wolfgang; and Hammann, Ingeborg, B 483,746.

Bender, Eberhard: *See—*
Wolf, Dieter; Bender, Eberhard; and Weber, Theodor, B 466,304.

Berkel, Wilhelm; and Gettert, Hans, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Partial or complete separation of gas mixtures, containing ammonia and carbon dioxide. B 456,905, Cl. 55-70.000.

Beyer, Karl-Heinz; Wulz, Klaus; and Kindscher, Wolfgang, to BASF Aktiengesellschaft. Alkali-stable, surface-active, anti-foam agents (acetals). B 409,310, Cl. 260-615.00A.

Blachly, Charles H.: *See—*
Deitz, Victor R.; and Blachly, Charles H., B 570,925.

Bladow, Arnold A.; and Ramsey, Francis E., to Swift & Company. Method of injecting poultry in the thigh and leg portions without penetrating the skin. B 481,989, Cl. 426-281.000.

Boctor, Stalin A., to Northern Electric Company, Limited. Second-order canonical active filter. B 532,326, Cl. 328-167.000.

Bogdanowicz, Mitchell Joseph, Jr., to Du Pont de Nemours, E. I., and Company. Method of making 4-amino-6-t-butyl-3-mercapto-1,2,4-triazin-5-one. B 514,259, Cl. 260-248.0AS.

Bohm, Georg G. A.; Pearson, Dale S.; and Tveekrem, James O., to Firestone Tire & Rubber Co., The. Radiation crosslinked polyvinyl chloride and process therefor. B 476,776, Cl. 204-159.160.

Boland, Bernard W., to Motorola, Inc. Method of fabricating an ensulated gate field-effect device. B 371,635, Cl. 427-93.000.

Borg-Warner Corporation: *See—*
van Hesden, Jan Willem, B 468,603.

Borm, David S.: *See—*
Barkhuff, Earl D.; Borm, David S.; McGinnis, Bernard W.; and Rosenlund, Bertel E., B 484,482.

Borst, John A., to Owens-Corning Fiberglas Corporation. Level-sensitive system. B 463,473, Cl. 73-302.000.

Bouchaudon, Jean; Bourat, Guy; and Margraff, Rodolphe, to Rhone-Poulenc, S.A. Polyoxetanes which can be used in peptide synthesis. B 493,474, Cl. 210-500.00M.

Bourat, Guy: *See—*
Bouchaudon, Jean; Bourat, Guy; and Margraff, Rodolphe, B 493,474.

Boyd, William Weller, to International Business Machines Corporation. Determination and printout of reference line. B 428,271, Cl. 340-172.500.

Cabaraux, Emile, to Solvay & Cie. Electrolytic cell. B 542,258, Cl. 204-252.000.

Callighan, Robert H.; and Hawthorne, John O., to United States Steel Corporation. Novel iron oxide catalysts. B 390,979, Cl. 252-455.00R.

Caragliano, Edward S.; and Nick, Howard H., to International Business Machines Corporation. Miniaturized strip-line directional coupler package having spirally wound coupling lines. B 535,256, Cl. 333-10.000.

Carborundum Company, The: *See—*
Batha, Howard D.; and Cross, Leslie E., B 589,179.

Carnahan, Robert D.: *See—*
Rossi, Ronald C.; and Carnahan, Robert D., B 750,679.

Carter, Gordon V.: *See—*
Roberts, Edward H.; and Carter, Gordon V., B 589,687.

Castellion, George Augustus; and Marzluff, William Frank, to American Cyanamid Company. Ammoxidation of alkanes. B 159,570, Cl. 260-465.300.

Caterpillar Tractor Co.: *See—*
Erickson, Rodney R.; Peters, Melvin H.; and McMillan, Daniel L., B 425,193.
Unruh, Dale H.; and Proksch, Frederick D., B 550,810.

Cave, Wilfred Johnson; and Culver, Edward George, to Hallam Polymers & Engineering Ltd. Towing etc. cable protection means. B 503,456, Cl. 114-230.000.

Celia, Richard Joseph, Jr., to Du Pont de Nemours, E. I., and Company. Hot melt sealants. B 570,721, Cl. 260-33.8UA.

Chase, Kenneth P.; Haynes, Harold L.; and Roberts, Michael G., to Owens-Corning Fiberglas Corporation. Glass fiber coated with a size comprising emulsified clad particles of poly(methyl methacrylate). B 415,590, Cl. 428-378.000.

Cherkofsky, Saul Carl, to Du Pont de Nemours, E. I., and Company. 1,1,3-Trisubstituted hydroxyguanidines. B 533,652, Cl. 260-565.000.

Chevron Research Company: *See—*
Hutchison, Stanley O., B 430,326.

Chu, Victor Fu Hua, to Du Pont de Nemours, E. I., and Company. Fast drying ink. B 592,658, Cl. 260-31.80N.

Chu, William M.; and Lee, James M., to IBM. FET load gate compensator. B 525,133, Cl. 307-262.000.

Chumbley, Lewis E.; Sams, Lawrence L., II; McFadden, Russell T.; Longoria, Juan, III; Tomalia, Donald A.; Thomas, Robert J.; and Lalk, James W., to Dow Chemical Company, The. Cellulosic sizing agents. B 432,265, Cl. 106-213.000.

Ciba-Geigy Corporation: *See—*
Dellian, Kurt A.; and Isharani, Jayanti V., B 537,058.
Jager, Horst, B 442,953.
Wurmli, Albert, B 520,995.

Clean Air Company, Inc.: *See—*
Graffman, Johan Holger, B 412,124.

Coats, Carlton E.: *See—*
Watts, Golden F.; and Coats, Carlton E., B 326,211.

Comer, Robert C., to Toro Company, The. Low speed rotary mower. B 494,167, Cl. 56-13.400.

Corson, Frederick P.: *See—*
Stevens, Violete L.; Sexton, Arthur R.; and Corson, Frederick P., B 444,078.

Cross, Leslie E.: *See—*
Batha, Howard D.; and Cross, Leslie E., B 589,179.

Culver, Edward George: *See—*
Cave, Wilfred Johnson; and Culver, Edward George, B 503,456.

Daeuble, Manfred: *See—*
Greif, Norbert; Vescia, Michele; Daeuble, Manfred; and Heinrich, Hans, B 497,571.

D'Alelio, Gaetano F., to University of Notre Dame du Lac. Polymerizing bis-maleimides. B 497,490, Cl. 260-78.0UA.

Davis, Ralph A.: *See—*
Pews, R. Garth; and Davis, Ralph A., B 369,373.

Deitz, Victor R.; and Blachly, Charles H. Activation of water soluble amines by halogens for trapping methyl radioactive iodine from air streams. B 570,925, Cl. 55-71.000.

Dellian, Kurt A.; and Isharani, Jayanti V., to Ciba-Geigy Corporation. Dyeing and printing synthetic hydrophobic fibers with a carrier comprising phenyl cyclohexane and derivatives. B 537,058, Cl. 8-173.000.

Del Pesco, Thomas W., to Du Pont de Nemours, E. I., and Company. Synthesis of aromatic amines by reaction of aromatic compounds with ammonia. B 429,027, Cl. 260-296.00R.

Diessel, Paul; Helfert, Herbert; Hamm, Reiner; and Scharpenberg, Hans-Georg, to BASF Aktiengesellschaft. Surfactants containing iodine. B 530,303, Cl. 252-106.000.

Digital Equipment Corporation: *See*—
Levy, John V.; Jenkins, Steven R.; Ku, Victor; McLean, Peter; and Hastings, Thomas N., B 432,140.

Doerflinger, Karl; Renner, Hermann; and Theus, Richard. Module for supporting circuit boards. B 508,639, Cl. 317-100.000.

Dow Chemical Company, The: *See*—
Chumbley, Lewis E.; Sams, Lawrence L., II; McFadden, Russell T.; Longoria, Juan, III; Tomalia, Donald A.; Thomas, Robert J.; and Lalk, James W., B 432,265.
McGregor, Stanley D., B 537,053.
Stevens, Violete L.; Sexton, Arthur R.; and Corson, Frederick P., B 444,078.

Du Pont de Nemours, E. I., and Company: *See*—
Bogdanowicz, Mitchell Joseph, Jr., B 514,259.
Cella, Richard Joseph, Jr., B 570,721.
Cherkofsky, Saul Carl, B 533,652.
Chu, Victor Fu Hua, B 592,658.
Del Pesco, Thomas W., B 429,027.
England, David C.; and Krespan, Carl G., B 357,526.
Froehlich, Helmut Hermann; and Lautenberger, William Jacob, B 433,707.
Goddard, Steven Jerome, B 536,322.
Hoeschele, Guenther Kurt, B 236,266.
Horowitz, Samuel Jacob, B 553,421.
Jacobson, Howard Wayne, B 581,564.
Khanna, Ram-Tirth, B 590,502.
Lewis, William Dein, B 573,994.
Parthemore, Keith Gordon, B 504,156.
Pedersen, Charles John, B 521,025.
Richards, Joseph A., B 547,016.
Richman, Jack E., B 403,326.
Roura, Miguel Jacinto, B 564,902.
Short, Oliver Alton, B 466,419.
Tanikella, Murty S.; and von Susani, Odorich, B 559,700.
Tanikella, Murty S.; and von Susani, Odorick, B 559,701.
Urquhart, Thomas, B 455,806.

Eastman, Larry B.; and Kenigsberg, Irwin J., to United Technologies Corporation. Spherical bifilar tuning pin bushing. B 567,158, Cl. 416-145.000.

Edwards, John Wilmar; and Farrant, Barry William, to Imperial Chemical Industries Ltd. Coating compositions comprising tetrafluoroethylene polymers and aluminum hydroxychloride. B 567,076, Cl. 260-29.60F.

Egelhof, Dieter: *See*—
Wolf, Karl; and Egelhof, Dieter, B 552,629.

Einstman, William J.: *See*—
Klug, Sigmund L.; Patrizio, Frederick J.; and Einstman, William J., B 333,838.

Eli Lilly and Company: *See*—
Holmes, Richard E.; and Jourdan, Glen P., B 427,946.
Kukolja, Stjepan P.; and Lammert, Steven R., B 371,095.

England, David C.; and Krespan, Carl G., to Du Pont de Nemours, E. I., and Company. Process for the preparation of carbacyl halosulfates. B 357,526, Cl. 260-545.00R.

Erickson, Rodney R.; Peters, Melvin H.; and McMillan, Daniel L., to Caterpillar Tractor Co. Disposable fluid actuator. B 425,193, Cl. 92-163.000.

Fahrenschon, Franz; Jager, Horst; Thinschmidt, Hans; and Meier, Alfred, to Siemens Aktiengesellschaft. Circuit arrangement for communication facilities wherein transmission paths can be employed for different types of message switching. B 462,030, Cl. 179-2.0DP.

Farbenfabriken Bayer Aktiengesellschaft: *See*—
Frommer, Werner; Puls, Walter; Schafer, Dietmar; and Schmidt, Delf, B 493,463.

Farkas, Walter G.; Hoehn, Willard M.; and Zawadzki, Joseph F., to G. D. Searle & Co. Process for isolation of aspartyl dipeptide esters. B 485,972, Cl. 260 112.50R.

Farrant, Barry William: *See*—
Edwards, John Wilmar; and Farrant, Barry William, B 567,076.

Fay, Charles Robert; and Richter, James Douglas, to Formica Corporation. Interactive roll gap-reverse roll speed control of the applicator of a material treater. B 520,082, Cl. 235-151.100.

Firestone Tire & Rubber Co., The: *See*—
Bohm, Georg G. A.; Pearson, Dale S.; and Tveekrem, James O., B 476,776.

Fischer, Edgar: *See*—
Luders, Walter; and Fischer, Edgar, B 479,556.

Fischer, Martin; Quadbeck-Seeger, Hans-Juergen; Kilpper, Gerhard; Schecker, Hans-Georg; and Koehler, Waldemar, to BASF Aktiengesellschaft. Production of 1-methyl-3-phenylindans. B 354,222, Cl. 204-162.00R.

Flanagan, Charles D., to Texas Instruments Incorporated. Magnetic relay. B 526,654, Cl. 335-186.000.

Florent, Jean; Lunel, Jean; and Renaut, Jacques, to Rhone-Poulenc, S.A. Process for the preparation of the antibiotic 20.798 R.P. B 527,040, Cl. 195-80.00R.

Fogel, Arnold W.; and Mercurio, Anthony F., to American Cyanamid Company. Shampoo creme rinse containing a quaternary ammonium saccharinate, cyclamate or phthalimidate. B 438,048, Cl. 424-70.000.

Formica Corporation: *See*—
Fay, Charles Robert; and Richter, James Douglas, B 520,082.

Forsyth, Bruce Adam; and Warner, Richard Burridge, to ICI Australia Limited. Halomethanesulfonamides for eradicating internal parasites. B 516,804, Cl. 424-321.000.

Freed, Meier E.; and Potoski, John R., to American Home Products Corporation. Benzobicycloalkane imines. B 421,373, Cl. 260-566.00R.

Fritze, Helmut: *See*—
Hultzsch, Kurt; and Fritze, Helmut, B 559,441.

Froehlich, Helmut Hermann; and Lautenberger, William Jacob, to Du Pont de Nemours, E. I., and Company. Powdered cleaning composition of urea-formaldehyde. B 433,707, Cl. 252-544.000.

Frommer, Werner; Puls, Walter; Schafer, Dietmar; and Schmidt, Delf, to Farbenfabriken Bayer Aktiengesellschaft. Glycoside-hydrolase enzyme inhibitors. B 493,463, Cl. 195-31.00R.

Frontier Machinery Company: *See*—
Ott, Eduard Karl, B 523,226.

Fujimoto, Isao; Kasubuchi, Takeshi; and Aiba, Masahiko, to Nippon Telegraph and Telephone Public Corporation; and Sharp Kabushiki Kaisha. State detection arrangement for ink jet system printer. B 450,413, Cl. 346-75.000.

Funke, Walter: *See*—
Schonberger, Helmut; Wolfsberger, Manfred; and Funke, Walter, B 502,151.

G. D. Searle & Co.: *See*—
Farkas, Walter G.; Hoehn, Willard M.; and Zawadzki, Joseph F., B 485,972.
Goldkamp, Arthur H.; Mazur, Robert H.; and Schlatter, James M., B 442,431.

Gelsenberg Aktiengesellschaft: *See*—
Richter, Gunther, B 441,543.

General Electric Company: *See*—
Roberts, Edward H.; and Carter, Gordon V., B 589,687.

General Foods Corporation: *See*—
Klug, Sigmund L.; Patrizio, Frederick J.; and Einstman, William J., B 333,838.
Stahl, Howard D., B 389,605.

General Motors Corporation: *See*—
Jacobs, James W., B 570,615.
Schonberger, Helmut; Wolfsberger, Manfred; and Funke, Walter, B 502,151.

Gettert, Hans: *See*—
Berkel, Wilhelm; and Gettert, Hans, B 456,905.

Goddard, Steven Jerome, to Du Pont de Nemours, E. I., and Company. Herbicidal 2-fluoro-4-halo-phenyl-4,5,6,7-tetrahydro-2H-isoindole-1,3-diones. B 536,322, Cl. 260-326.0HL.

Gold, Heinrich: *See*—
Wolfrum, Gerhard; and Gold, Heinrich, B 591,141.

Goldkamp, Arthur H.; Mazur, Robert H.; and Schlatter, James M., to G. D. Searle & Co. 3-Amino-N-substituted succinamic acids and intermediates thereto. B 442,431, Cl. 260-514.00J.

Gonzalez, Boris, to Societe Anonyme Automobiles Citroen. Anthropomorphological dummy for studying the behaviour of the human body. B 546,097, Cl. 35-17.000.

Gooding, David N.; and Shimp, Everett M., to International Business Machines Corporation. Upper bounds address checking system for providing storage protection for a digital data processor. B 587,936, Cl. 235-153.0AM.

Goser, Karl; and Pomper, Michael, to Siemens Aktiengesellschaft. Process for transmitting signals between two chips with high-speed complementary MOS circuits. B 506,840, Cl. 307-251.000.

Graffman, Johan Holger, to Clean Air Company, Inc. Compressed oil burner starting mechanism. B 412,124, Cl. 431-1.000.

Gregor, Harry P., to Gregor, Harry P. Crosslinked, interpolymer fixed-charge membranes. B 433,930, Cl. 210-500.00M.

Gregory, Richard A., Jr.: *See*—
Marshall, Walter R.; Gregory, Richard A., Jr.; and Handwerk, Richard H., B 356,470.

Greif, Norbert; Vescia, Michele; Daeuble, Manfred; and Heinrich, Hans, to BASF Aktiengesellschaft. Levelling auxiliaries for acid dyes. B 497,571, Cl. 8-169.000.

Gunn, Robert D. Shaking machine. B 410,694, Cl. 91-40.000.

Haarmann & Reimer Gesellschaft mit beschrankter Haftung: *See*—
Leidig, Theodor, B 524,849.

Hallam Polymers & Engineering Ltd.: *See*—
Cave, Wilfred Johnson; and Culver, Edward George, B 503,456.

Hamm, Reiner: *See*—
Diessel, Paul; Helfert, Herbert; Hamm, Reiner; and Scharpenberg, Hans-Georg, B 530,303.

Hammann, Ingeborg: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Hammann, Ingeborg; and Stendel, Wilhelm, B 498,288.
Kuhle, Engelbert; Siegle, Peter; Behrenz, Wolfgang; and Hammann, Ingeborg, B 483,746.
Sirrenberg, Wilhelm; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, B 510,836.

Handwerk, Richard H.: *See*—
Marshall, Walter R.; Gregory, Richard A., Jr.; and Handwerk, Richard H., B 356,470.

Hashiguchi, Yukihide; and Mitsui, Ryozo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Flow control valve for exhaust gas purifying system. B 480,384, Cl. 251-28.000.

Hastings, Thomas N.: *See*—
Levy, John V.; Jenkins, Steven R.; Ku, Victor; McLean, Peter; and Hastings, Thomas N., B 432,140.

Hawthorne, John O.: *See—*
Callighan, Robert H.; and Hawthorne, John O., B 390,979.
Hayashi, Hisao: *See—*
Matsushita, Takeshi; and Hayashi, Hisao, B 520,115.
Haynes, Harold L.: *See—*
Chase, Kenneth P.; Haynes, Harold L.; and Roberts, Michael G., B 415,590.
Headway Research, Inc.: *See—*
Shipman, Vern D., B 505,582.
Heinrich, Hans: *See—*
Greif, Norbert; Vescia, Michele; Daeuble, Manfred; and Heinrich, Hans, B 497,571.
Helfert, Herbert: *See—*
Diessel, Paul; Helfert, Herbert; Hamm, Reiner; and Scharpenberg, Hans-Georg, B 530,303.
Hitachi, Ltd.: *See—*
Kamiya, Kunio; Yusa, Hideo; Nakajima, Fumito; and Takeuchi, Masato, B 428,386.
Kanda, Kimio; and Ohtaka, Tadashi, B 485,926.
Moriya, Hisanori; and Osawa, Tadao, B 405,899.
Nagashima, Shigeo, B 452,138.
Ogirima, Masahiko; Shinoda, Toshimitu; Ono, Yuichi; and Kusumoto, Hajime, B 105,006.
Tarutani, Yoshinobu; Kawabe, Ushio; Kudo, Mitsuhiro; and Taguchi, Sadanori, B 403,883.
Hoechst Aktiengesellschaft: *See—*
Hultzsch, Kurt; and Fritze, Helmut, B 559,441.
Luders, Walter; and Fischer, Edgar, B 479,556.
Hoehn, Willard M.: *See—*
Farkas, Walter G.; Hoehn, Willard M.; and Zawadzki, Joseph F., B 485,972.
Hoeschele, Guenther Kurt, to Du Pont de Nemours, E. I., and Company. Branched thermoplastic copolyesters. B 236,266, Cl. 260-75.00R.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. O-ethyl-S-n-propyl-O-[pyridaz-(6)-on-(3)-yl]-thionothiolphosphoric acid esters. B 498,288, Cl. 260-250.00P.
Hoffmann-La Roche Inc.: *See—*
Townsend, John Melvin; and Valentine, Donald Herman, Jr., B 518,326.
Holmes, Richard E.; and Jourdan, Glen P., to Eli Lilly and Company. Thio-substituted 2-oxo-indolines. B 427,946, Cl. 260-325.00R.
Homeyer, Bernhard: *See—*
Sirrenberg, Wilhelm; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, B 510,836.
Horowitz, Samuel Jacob, to Du Pont de Nemours, E. I., and Company. Novel silver compositions. B 553,421, Cl. 252-514.000.
Horstmann, Harald: *See—*
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, B 459,408.
Hughes, Gordon Allan; and Smith, Herchel, to Smith, Herchel. Synthesis of gon-4-enes. B 337,823, Cl. 424-243.000.
Hultzsch, Kurt; and Fritze, Helmut, to Hoechst Aktiengesellschaft. Resinous composition. B 559,441, Cl. 260-33.6UA.
Hutchison, Stanley O., to Chevron Research Company. Field dressable inflatable packer. B 430,326, Cl. 277-34.600.
Ibi, Takuro: *See—*
Yamamoto, Kozo; and Ibi, Takuro, B 513,134.
IBM: *See—*
Chu, William M.; and Lee, James M., B 525,133.
ICI Australia Limited: *See—*
Forsyth, Bruce Adam; and Warner, Richard Burridge, B 516,804.
Imperial Chemical Industries Ltd.: *See—*
Edwards, John Wilmar; and Farrant, Barry William, B 567,076.
International Business Machines Corp.: *See—*
Barkhuff, Earl D.; Borm, David S.; McGinnis, Bernard W.; and Rosenlund, Bertel E., B 484,482.
Boyd, William Weller, B 428,271.
Caragliano, Edward S.; and Nick, Howard H., B 535,256.
Gooding, David N.; and Shimp, Everett M., B 587,936.
Isharani, Jayanti V.: *See—*
Dellian, Kurt A.; and Isharani, Jayanti V., B 537,058.
Isobe, Mitsuo: *See—*
Yasumatsuya, Noboru; and Isobe, Mitsuo, B 422,156.
J. M. Voith, GmbH: *See—*
Wolf, Karl; and Egelhof, Dieter, B 552,629.
Jacobs, James W., to General Motors Corporation. Air conditioning compressor. B 570,615, Cl. 417-274.000.
Jacobson, Howard Wayne, to Du Pont de Nemours, E. I., and Company. Amorphous silicon nitride composition containing carbon, and vapor phase process. B 581,564, Cl. 106-47.00R.
Jager, Horst, to Ciba-Geigy Corporation. New perfluoroalkylalkylcarboxylic acids, process for their manufacture and their use. B 442,953, Cl. 260-408.000.
Jager, Horst: *See—*
Fahrenschon, Franz; Jager, Horst; Thinschmidt, Hans; and Meier, Alfred, B 462,030.
Jenkins, Steven R.: *See—*
Levy, John V.; Jenkins, Steven R.; Ku, Victor; McLean, Peter; and Hastings, Thomas N., B 432,140.
Jensen, Harry T., to United Technologies Corporation. Full-circle contact electrical slip-ring brush. B 566,556, Cl. 339-5.00M.
Jourdan, Glen P.: *See—*
Holmes, Richard E.; and Jourdan, Glen P., B 427,946.
Kamiya, Kunio; Yusa, Hideo; Nakajima, Fumito; and Takeuchi, Masato, to Hitachi, Ltd. Process for treating waste gas in reprocessing of used nuclear fuel. B 428,386, Cl. 423-249.000.
Kanda, Kimio; and Ohtaka, Tadashi, to Hitachi, Ltd. Apparatus for displaying image of specimen. B 485,926, Cl. 250-310.000.
Kane, John L.; and Machlan, George R., to Owens-Corning Fiberglas Corporation. Production of organic fibers with inorganic cores. B 557,721, Cl. 65-11.00W.
Kanner, Bernard: *See—*
Prokai, Bela; and Kanner, Bernard, B 503,776.
Kao, Wen-Ling: *See—*
Strike, Donald P.; and Kao, Wen-Ling, B 494,138.
Kao, Wenling; and Strike, Donald P., to American Home Products Corporation. Prostaglandin derivatives. B 491,711, Cl. 260-240.00R.
Kasubuchi, Takeshi: *See—*
Fujimoto, Isao; Kasubuchi, Takeshi; and Aiba, Masahiko, B 450,413.
Kawabe, Ushio: *See—*
Tarutani, Yoshinobu; Kawabe, Ushio; Kudo, Mitsuhiro; and Taguchi, Sadanori, B 403,883.
Kelsall, Dennis, to United States of America, Air Force. Triangular interferometric light-source tracker. B 492,093, Cl. 356-110.000.
Kenigsberg, Irwin J.: *See—*
Eastman, Larry B.; and Kenigsberg, Irwin J., B 567,158.
Khanna, Ram-Tirth, to Du Pont de Nemours, E. I., and Company. Polymeric fibers containing color concentrates. B 590,502, Cl. 260-40.00R.
Kiemle, Horst. Holographic storage device. B 453,067, Cl. 340-173.0LM.
Kilpper, Gerhard: *See—*
Fischer, Martin; Quadbeck-Seeger, Hans-Juergen; Kilpper, Gerhard; Schecker, Hans-Georg; and Koehler, Waldemar, B 354,222.
Kimura, Shigeo: *See—*
Seino, Hiroshi; Yamada, Norio; Kimura, Shigeo; Kosugi, Hideaki; and Yamamoto, Koreyuki, B 380,137.
Kindscher, Wolfgang: *See—*
Beyer, Karl-Heinz; Wulz, Klaus; and Kindscher, Wolfgang, B 409,310.
Kitamura, Eiichi: *See—*
Kitamura, Ryoichi; Kitamura, Eiichi; Kitamura, Tetsuo; and Kitamura, Tameo, B 382,120.
Kitamura, Ryoichi; Kitamura, Eiichi; Kitamura, Tetsuo; and Kitamura, Tameo, to Kitamura, Eiichi; Kitamura, Tetsuo; and Kitamura, Tameo. Preparation of asymmetric iminodibenzyl compounds. B 382,120, Cl. 260-239.00D.
Kitamura, Tameo: *See—*
Kitamura, Ryoichi; Kitamura, Eiichi; Kitamura, Tetsuo; and Kitamura, Tameo, B 382,120.
Kitamura, Tetsuo: *See—*
Kitamura, Ryoichi; Kitamura, Eiichi; Kitamura, Tetsuo; and Kitamura, Tameo, B 382,120.
Klug, Sigmund L.; Patrizio, Frederick J.; and Einstman, William J., to General Foods Corporation. Iron-fortified soluble coffee and method for preparing same. B 333,838, Cl. 426-594.000.
Koehler, Waldemar: *See—*
Fischer, Martin; Quadbeck-Seeger, Hans-Juergen; Kilpper, Gerhard; Schecker, Hans-Georg; and Koehler, Waldemar, B 354,222.
Kolb, Robert E., to Minnesota Mining and Manufacturing Company. Fluoroelastomer composition. B 493,537, Cl. 260-47.0UP.
Koonz, Carl H.: *See—*
Strandine, Eldon J.; and Koonz, Carl H., B 493,686.
Kosugi, Hideaki: *See—*
Seino, Hiroshi; Yamada, Norio; Kimura, Shigeo; Kosugi, Hideaki; and Yamamoto, Koreyuki, B 380,137.
Krespan, Carl G.: *See—*
England, David C.; and Krespan, Carl G., B 357,526.
Kroebig, Helmut L.; and Riha, Frank J., III, to United States of America, Air Force. Heat pipe system. B 529,194, Cl. 165-32.000.
Ku, Victor: *See—*
Levy, John V.; Jenkins, Steven R.; Ku, Victor; McLean, Peter; and Hastings, Thomas N., B 432,140.
Kudo, Mitsuhiro: *See—*
Tarutani, Yoshinobu; Kawabe, Ushio; Kudo, Mitsuhiro; and Taguchi, Sadanori, B 403,883.
Kuhle, Engelbert; Siegle, Peter; Behrenz, Wolfgang; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. N-carboxylated N-methylcarbamic acid aryl esters. B 483,746, Cl. 260-479.00C.
Kukolja, Stjepan P.; and Lammert, Steven R., to Eli Lilly and Company. Process for cleaving an imido side chain from penicillins and cephalosporins. B 371,095, Cl. 260-239.100.
Kusumoto, Hajime: *See—*
Ogirima, Masahiko; Shinoda, Toshimitu; Ono, Yuichi; and Kusumoto, Hajime, B 105,006.
Lalk, James W.: *See—*
Chumbley, Lewis E.; Sams, Lawrence L., II; McFadden, Russell T.; Longoria, Juan, III; Tomalia, Donald A.; Thomas, Robert J.; and Lalk, James W., B 432,265.
Lammert, Steven R.: *See—*
Kukolja, Stjepan P.; and Lammert, Steven R., B 371,095.
Lannert, Kent P., to Monsanto Company. Substituted bis-(dicarboxymethyl)-ethers. B 426,157, Cl. 260-535.00P.

Lautenberger, William Jacob: *See—*
Froehlich, Helmut Hermann; and Lautenberger, William Jacob, B 433,707.

Lee, James M.: *See—*
Chu, William M.; and Lee, James M., B 525,133.

Leidig, Theodor, to Haarmann & Reimer Gesellschaft mit beschrankter Haftung. 4-Tricyclo[5,2,1,$0^{2,6}$]decyl-8-butanal. B 524,849, Cl. 260-598.000.

Levy, John V.; Jenkins, Steven R.; Ku, Victor; McLean, Peter; and Hastings, Thomas N., to Digital Equipment Corporation. Secondary storage facility for data processing systems. B 432,140, Cl. 340-172.500.

Lewis, William Dein, to Du Pont de Nemours, E. I., and Company. Friction measuring apparatus. B 573,994, Cl. 73-9.000.

Liebgott, Helmut, to Metallgesellschaft Aktiengesellschaft. Process for producing high-methane gas. B 521,985, Cl. 260-449.00M.

Longoria, Juan, III: *See—*
Chumbley, Lewis E.; Sams, Lawrence L., II; McFadden, Russell T.; Longoria, Juan, III; Tomalia, Donald A.; Thomas, Robert J.; and Lalk, James W., B 432,265.

Luders, Walter; and Fischer, Edgar, to Hoechst Aktiengesellschaft. Plastics material stabilized against ultraviolet radiation. B 479,556, Cl. 260-45.80R.

Lunel, Jean: *See—*
Florent, Jean; Lunel, Jean; and Renaut, Jacques, B 527,040.

Machlan, George R.: *See—*
Kane, John L.; and Machlan, George R., B 557,721.

Margraff, Rodolphe: *See—*
Bouchaudon, Jean; Bourat, Guy; and Margraff, Rodolphe, B 493,474.

Marshall, Walter R.; Gregory, Richard A., Jr.; and Handwerk, Richard H., to Union Carbide Corporation. Separation of liquid phases. B 356,470, Cl. 210-84.000.

Marzluff, William Frank: *See—*
Castellion, George Augustus; and Marzluff, William Frank, B 159,570.

Matsushita Electric Industrial Co., Ltd.: *See—*
Yamamoto, Kozo; and Ibi, Takuro, B 513,134.

Matsushita, Takeshi; and Hayashi, Hisao, to Sony Corporation. Semiconductor device with high voltage breakdown resistance. B 520,115, Cl. 357-52.000.

Maurer, Fritz: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Hammann, Ingeborg; and Stendel, Wilhelm, B 498,288.

Mazur, Robert H.: *See—*
Goldkamp, Arthur H.; Mazur, Robert H.; and Schlatter, James M., B 442,431.

McFadden, Russell T.: *See—*
Chumbley, Lewis E.; Sams, Lawrence L., II; McFadden, Russell T.; Longoria, Juan, III; Tomalia, Donald A.; Thomas, Robert J.; and Lalk, James W., B 432,265.

McGinnis, Bernard W.: *See—*
Barkhuff, Earl D.; Borm, David S.; McGinnis, Bernard W.; and Rosenlund, Bertel E., B 484,482.

McGregor, Stanley D., to Dow Chemical Company, The. Preparation of tetrachloropyridine. B 537,053, Cl. 260-290.0HL.

McLean, Peter: *See—*
Levy, John V.; Jenkins, Steven R.; Ku, Victor; McLean, Peter; and Hastings, Thomas N., B 432,140.

McMillan, Daniel L.: *See—*
Erickson, Rodney R.; Peters, Melvin H.; and McMillan, Daniel L., B 425,193.

Meier, Alfred: *See—*
Fahrenschon, Franz; Jager, Horst; Thinschmidt, Hans; and Meier, Alfred, B 462,030.

Meng, Karl: *See—*
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, B 459,408.

Mercurio, Anthony F.: *See—*
Fogel, Arnold W.; and Mercurio, Anthony F., B 438,048.

Metallgesellschaft Aktiengesellschaft: *See—*
Liebgott, Helmut, B 521,985.

Minnesota Mining and Manufacturing Company: *See—*
Kolb, Robert E., B 493,537.

Mitsui, Ryozo: *See—*
Hashiguchi, Yukihide; and Mitsui, Ryozo, B 480,384.

Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, to Bayer Aktiengesellschaft. Pyrazol-5-one pharmaceutical compositions and methods for effecting diuresis, saluresis and for treating hypertension. B 459,408, Cl. 424-273.000.

Monsanto Company: *See—*
Lannert, Kent P., B 426,157.

Moriya, Hisanori; and Osawa, Tadao, to Hitachi, Ltd. Exhaust gas recirculation device. B 405,899, Cl. 123-119.00A.

Moser, Jesse Lee; Reavis, Robert Philmore, Jr.; and Soderstrom, Melvin Andrew, to AMP Incorporated. Swing out load coil assembly. B 523,952, Cl. 336-65.000.

Motorola, Inc.: *See—*
Boland, Bernard W., B 371,635.

Nagashima, Shigeo, to Hitachi, Ltd. System for switching multiple virtual spaces. B 452,138, Cl. 340-172.500.

Nakajima, Fumito: *See—*
Kamiya, Kunio; Yusa, Hideo; Nakajima, Fumito; and Takeuchi, Masato, B 428,386.

Nick, Howard H.: *See—*
Caragliano, Edward S.; and Nick, Howard H., B 535,256.

Nippon Telegraph and Telephone Public Corporation: *See—*
Fujimoto, Isao; Kasubuchi, Takeshi; and Aiba, Masahiko, B 450,413.

Northern Electric Company, Limited: *See—*
Boctor, Stalin A., B 532,326.

Ogirima, Masahiko; Shinoda, Toshimitu; Ono, Yuichi; and Kusumoto, Hajime, to Hitachi, Ltd. Method of making an epitaxial growth layer of $GaAs_{1-x}P_x$ compound semiconductor. B 105,006, Cl. 148-175.000.

Ohtaka, Tadashi: *See—*
Kanda, Kimio; and Ohtaka, Tadashi, B 485,926.

Ono, Yuichi: *See—*
Ogirima, Masahiko; Shinoda, Toshimitu; Ono, Yuichi; and Kusumoto, Hajime, B 105,006.

Osawa, Tadao: *See—*
Moriya, Hisanori; and Osawa, Tadao, B 405,899.

Ott, Eduard Karl, to Frontier Machinery Company. Solid state alternating current switching device. B 523,226, Cl. 307-252.00B.

Owens-Corning Fiberglas Corporation: *See—*
Borst, John A., B 463,473.
Chase, Kenneth P.; Haynes, Harold L.; and Roberts, Michael G., B 415,590.
Kane, John L.; and Machlan, George R., B 557,721.
Thomas, William R., B 452,034.

Parthemore, Keith Gordon, to Du Pont de Nemours, E. I., and Company. Flow control system for the precipitation of silver halide emulsions. B 504,156, Cl. 235-151.120.

Passedouet, Andre Henri; and Pipon, Robert, to Rhone-Poulenc, S.A. Aluminium and/or magnesium salts of amino-acids. B 495,781, Cl. 260-448.00R.

Patrizio, Frederick J.: *See—*
Klug, Sigmund L.; Patrizio, Frederick J.; and Einstman, William J., B 333,838.

Pearson, Dale S.: *See—*
Bohm, Georg G. A.; Pearson, Dale S.; and Tveekrem, James O., B 476,776.

Pedersen, Charles John, to Du Pont de Nemours, E. I., and Company. Complexes of macrocyclic polyether with mercaptoimidazolines. B 521,025, Cl. 260-309.600.

Penzel, Hans-Joerg, to Siemens Aktiengesellschaft. Arrangement for reducing the access time in a storage system. B 506,839, Cl. 340-172.500.

Peters, Melvin H.: *See—*
Erickson, Rodney R.; Peters, Melvin H.; and McMillan, Daniel L., B 425,193.

Petschauer, Richard J., to Sperry Rand Corporation. Error logging in semiconductor storage units. B 563,419, Cl. 235-153.0AK.

Pews, R. Garth; and Davis, Ralph A. Process for making β-bromocitraconic anhydride. B 369,373, Cl. 260-346.80R.

Pierlot, Michel, to Societe Industrielle de Brevets et d'Etudes. Fuel feed device for internal combustion engine. B 480,251, Cl. 123-139.0AW.

Pipon, Robert: *See—*
Passedouet, Andre Henri; and Pipon, Robert, B 495,781.

Polaroid Corporation: *See—*
Sullivan, Charles I., B 552,709.

Pollet, Robert Joseph; Vandeputte, Camille Angelina; Sels, Francis Jeanne; Vanreusel, Gerard Laurens; Willems, Jozef Frans; and van Veelen, George Frans, to Agfa-Gevaert, N.V. Development of photographic silver halide elements. B 417,498, Cl. 96-66.300.

Pomper, Michael: *See—*
Goser, Karl; and Pomper, Michael, B 506,840.

Pospischil, Reginhard, to Siemens Aktiengesellschaft. PCM regenerator. B 559,631, Cl. 178-70.00R.

Potoski, John R.: *See—*
Freed, Meier E.; and Potoski, John R., B 421,373.

Price, Roger Charles. Flow improvers. B 407,812, Cl. 44-62.000.

Prokai, Bela; and Kanner, Bernard, to Union Carbide Corporation. Organosilicone polymer solutions. B 503,776, Cl. 106-316.000.

Proksch, Frederick D.: *See—*
Unruh, Dale H.; and Proksch, Frederick D., B 550,810.

Puls, Walter: *See—*
Frommer, Werner; Puls, Walter; Schafer, Dietmar; and Schmidt, Delf, B 493,463.

Quadbeck-Seeger, Hans-Juergen: *See—*
Fischer, Martin; Quadbeck-Seeger, Hans-Juergen; Kilpper, Gerhard; Schecker, Hans-Georg; and Koehler, Waldemar, B 354,222.

Ramsey, Francis E.: *See—*
Bladow, Arnold A.; and Ramsey, Francis E., B 481,989.

RCA Corporation: *See—*
Ahmed, Adel Abdel Aziz, B 531,686.
Sutphin, Eldon Marvin, Jr., B 573,033.
Wittlinger, Harold Allen, B 534,915.

Reavis, Robert Philmore, Jr.: *See—*
Moser, Jesse Lee; Reavis, Robert Philmore, Jr.; and Soderstrom, Melvin Andrew, B 523,952.

Reindl, Klaus, to Siemens Aktiengesellschaft. Metal semiconductor diode. B 281,162, Cl. 357-15.000.

Renaut, Jacques: *See—*
Florent, Jean; Lunel, Jean; and Renaut, Jacques, B 527,040.

Renner, Hermann: *See—*
Doerflinger, Karl; Renner, Hermann; and Theus, Richard, B 508,639.

Rhone-Poulenc, S.A.: *See—*
Bouchaudon, Jean; Bourat, Guy; and Margraff, Rodolphe, B 493,474.
Florent, Jean; Lunel, Jean; and Renaut, Jacques, B 527,040.
Passedouet, Andre Henri; and Pipon, Robert, B 495,781.

Richards, Joseph A., to Du Pont de Nemours, E. I., and Company. Bulk container unloading apparatus. B 547,016, Cl. 259-8.000.

Richman, Jack E., to Du Pont de Nemours, E. I., and Company. Macrocyclic polyamines. B 403,326, Cl. 260-239.0BC.

Richter, Gunther, to Gelsenberg Aktiengesellschaft. Method of refining pyromellitic acid dianhydride. B 441,543, Cl. 203-73.000.

Richter, James Douglas: *See—*
Fay, Charles Robert; and Richter, James Douglas, B 520,082.

Richter, Peter: *See—*
Volkert, Otto; Wigger, August; Zuerger, Manfred; and Richter, Peter, B 421,608.

Riebel, Hans-Jochem: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Hammann, Ingeborg; and Stendel, Wilhelm, B 498,288.

Riha, Frank J., III: *See—*
Kroebig, Helmut L.; and Riha, Frank J., III, B 529,194.

Roberts, Edward H.; and Carter, Gordon V., to General Electric Company. Door handle of a household refrigerator. B 589,687, Cl. 16-125.000.

Roberts, Michael G.: *See—*
Chase, Kenneth P.; Haynes, Harold L.; and Roberts, Michael G., B 415,590.

Rohe, Lothar: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Hammann, Ingeborg; and Stendel, Wilhelm, B 498,288.

Rosenlund, Bertel E.: *See—*
Barkhuff, Earl D.; Borm, David S.; McGinnis, Bernard W.; and Rosenlund, Bertel E., B 484,482.

Rossi, Ronald C.; and Carnahan, Robert D., to United States of America, Air Force. Thermal shock resistant ceramic composite. B 750,679, Cl. 106-58.000.

Roura, Miguel Jacinto, to Du Pont de Nemours, E. I., and Company. Process for preparing tetrafluoroethylene-hexafluoropropylene copolymer blends. B 564,902, Cl. 260-900.000.

Sams, Lawrence L., II: *See—*
Chumbley, Lewis E.; Sams, Lawrence L., II; McFadden, Russell T.; Longoria, Juan, III; Tomalia, Donald A.; Thomas, Robert J.; and Lalk, James W., B 432,265.

Schafer, Dietmar: *See—*
Frommer, Werner; Puls, Walter; Schafer, Dietmar; and Schmidt, Delf, B 493,463.

Scharpenberg, Hans-Georg: *See—*
Diessel, Paul; Helfert, Herbert; Hamm, Reiner; and Scharpenberg, Hans-Georg, B 530,303.

Schecker, Hans-Georg: *See—*
Fischer, Martin; Quadbeck-Seeger, Hans-Juergen; Kilpper, Gerhard; Schecker, Hans-Georg; and Koehler, Waldemar, B 354,222.

Schlatter, James M.: *See—*
Goldkamp, Arthur H.; Mazur, Robert H.; and Schlatter, James M., B 442,431.

Schmidt, Delf: *See—*
Frommer, Werner; Puls, Walter; Schafer, Dietmar; and Schmidt, Delf, B 493,463.

Schonberger, Helmut; Wolfsberger, Manfred; and Funke, Walter, to General Motors Corporation. Internal combustion engine air induction assembly. B 502,151, Cl. 55-417.000.

Seino, Hiroshi; Yamada, Norio; Kimura, Shigeo; Kosugi, Hideaki; and Yamamoto, Koreyuki. Oil-impregnated sintered product and method of producing same. B 380,137, Cl. 252-12.200.

Sels, Francis Jeanne: *See—*
Pollet, Robert Joseph; Vandeputte, Camille Angelina; Sels, Francis Jeanne; Vanreusel, Gerard Laurens; Willems, Jozef Frans; and van Veelen, George Frans, B 417,498.

Sexton, Arthur R.: *See—*
Stevens, Violete L.; Sexton, Arthur R.; and Corson, Frederick P., B 444,078.

Sharp Kabushiki Kaisha: *See—*
Fujimoto, Isao; Kasubuchi, Takeshi; and Aiba, Masahiko, B 450,413.

Shimp, Everett M.: *See—*
Gooding, David N.; and Shimp, Everett M., B 587,936.

Shinoda, Toshimitu: *See—*
Ogirima, Masahiko; Shinoda, Toshimitu; Ono, Yuichi; and Kusumoto, Hajime, B 105,006.

Shipman, Vern D., to Headway Research, Inc. Apparatus for spinning a microelectronic substrate. B 505,582, Cl. 318-119.000.

Short, Oliver Alton, to Du Pont de Nemours, E. I., and Company. Silver compositions. B 466,419, Cl. 106-1.000.

Siegle, Peter: *See—*
Kuhle, Engelbert; Siegle, Peter; Behrenz, Wolfgang; and Hammann, Ingeborg, B 483,746.

Siemens Aktiengesellschaft: *See—*
Fahrenschon, Franz; Jager, Horst; Thinschmidt, Hans; and Meier, Alfred, B 462,030.
Goser, Karl; and Pomper, Michael, B 506,840.
Penzel, Hans-Joerg, B 506,839.
Pospischil, Reginhard, B 559,631.
Reindl, Klaus, B 281,162.

Sirrenberg, Wilhelm; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating pests with dichlorovinylthionophosphoric acid ester amides. B 510,836, Cl. 424-219.000.

Smith, Herchel: *See—*
Hughes, Gordon Allan; and Smith, Herchel, B 337,823.

Societe Anonyme Automobiles Citroen: *See—*
Gonzalez, Boris, B 546,097.

Societe Anonyme — Poclain: *See—*
Wolf, Didier Albert, B 536,403.

Societe Industrielle de Brevets et d'Etudes: *See—*
Pierlot, Michel, B 480,251.

Soderstrom, Melvin Andrew: *See—*
Moser, Jesse Lee; Reavis, Robert Philmore, Jr.; and Soderstrom, Melvin Andrew, B 523,952.

Solvay & Cie: *See—*
Cabaraux, Emile, B 542,258.

Sony Corporation: *See—*
Matsushita, Takeshi; and Hayashi, Hisao, B 520,115.

Sperry Rand Corporation: *See—*
Petschauer, Richard J., B 563,419.

Stahl, Howard D., to General Foods Corporation. Dry carbonated beverage concentrate employing amorphous calcium carbonate. B 389,605, Cl. 426-561.000.

Stendel, Wilhelm: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Hammann, Ingeborg; and Stendel, Wilhelm, B 498,288.
Sirrenberg, Wilhelm; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, B 510,836.

Stephens, Norman S. Wall thermostat conversion kit assembly. B 527,333, Cl. 248-309.00R.

Stevens, Violete L.; Sexton, Arthur R.; and Corson, Frederick P., to Dow Chemical Company, The. Linear copolymers of glycidol. B 444,078, Cl. 260-47.0EQ.

Strandine, Eldon J.; and Koonz, Carl H., to Swift & Company. Method for injecting a liquid additive into poultry flesh without penetrating the skin. B 493,686, Cl. 426-281.000.

Strike, Donald P.; and Kao, Wen-Ling, to American Home Products Corporation. Prostaglandin derivatives. B 494,138, Cl. 260-514.00D.

Strike, Donald P.: *See—*
Kao, Wenling; and Strike, Donald P., B 491,711.

Sullivan, Charles I., to Polaroid Corporation. Method for producing zinc anode. B 552,709, Cl. 427-123.000.

Sutphin, Eldon Marvin, Jr., to RCA Corporation. Fast automatic gain control circuit with adjustable range. B 573,033, Cl. 328-168.000.

Swift & Company: *See—*
Bladow, Arnold A.; and Ramsey, Francis E., B 481,989.
Strandine, Eldon J.; and Koonz, Carl H., B 493,686.

Taguchi, Sadanori: *See—*
Tarutani, Yoshinobu; Kawabe, Ushio; Kudo, Mitsuhiro; and Taguchi, Sadanori, B 403,883.

Takeuchi, Masato: *See—*
Kamiya, Kunio; Yusa, Hideo; Nakajima, Fumito; and Takeuchi, Masato, B 428,386.

Tanikella, Murty S.; and von Susani, Odorich, to Du Pont de Nemours, E. I., and Company. Fibers of acid-dyeable polyester having tetramethylpiperidine groups attached through oxyalkalene linkages to ends of polymer chains. B 559,700, Cl. 260-75.00N.

Tanikella, Murty S.; and von Susani, Odorick, to Du Pont de Nemours, E. I., and Company. Acid-dyeable fibers of polyester modified with tetramethylpiperidine polyether glycols. B 559,701, Cl. 260-75.00N.

Tarutani, Yoshinobu; Kawabe, Ushio; Kudo, Mitsuhiro; and Taguchi, Sadanori, to Hitachi, Ltd. Superconductive elements and method for producing the same. B 403,883, Cl. 428-469.000.

Tellie, Paul E. Firearms. B 470,853, Cl. 89-142.000.

Texas Instruments Incorporated: *See—*
Flanagan, Charles D., B 526,654.

Theus, Richard: *See—*
Doerflinger, Karl; Renner, Hermann; and Theus, Richard, B 508,639.

Thinschmidt, Hans: *See—*
Fahrenschon, Franz; Jager, Horst; Thinschmidt, Hans; and Meier, Alfred, B 462,030.

Thomas, McKinley B., to United States Steel Corporation. Plate mill finishing stand roll latch ring. B 563,932, Cl. 72-238.000.

Thomas, Robert J.: *See—*
Chumbley, Lewis E.; Sams, Lawrence L., II; McFadden, Russell T.; Longoria, Juan, III; Tomalia, Donald A.; Thomas, Robert J.; and Lalk, James W., B 432,265.

Thomas, William R., to Owens-Corning Fiberglas Corporation. Insulation for a vehicle roof. B 452,034, Cl. 296-137.00A.

Thompson, Larry L. Cartridge tape machine cleaner apparatus. B 449,892, Cl. 360-137.000.

Tomalia, Donald A.: *See—*
Chumbley, Lewis E.; Sams, Lawrence L., II; McFadden, Russell T.; Longoria, Juan, III; Tomalia, Donald A.; Thomas, Robert J.; and Lalk, James W., B 432,265.

Toro Company, The: *See—*
Comer, Robert C., B 494,167.

Townsend, John Melvin; and Valentine, Donald Herman, Jr., to Hoffmann-La Roche Inc. Preparation of triaryl phosphines. B 518,326, Cl. 260-606.50P.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Hashiguchi, Yukihide; and Mitsui, Ryozo, B 480,384.

Tveekrem, James O.: *See—*
Bohm, Georg G. A.; Pearson, Dale S.; and Tveekrem, James O., B 476,776.
Union Carbide Corporation: *See—*
Marshall, Walter R.; Gregory, Richard A., Jr.; and Handwerk, Richard H., B 356,470.
Prokai, Bela; and Kanner, Bernard, B 503,776.
United States of America
Air Force: *See—*
Kelsall, Dennis, B 492,093.
Kroebig, Helmut L.; and Riha, Frank J., III, B 529,194.
Rossi, Ronald C.; and Carnahan, Robert D., B 750,679.
U.S. Philips Corporation: *See—*
Van Turnhout, Jan, B 557,274.
United States Steel Corporation: *See—*
Callighan, Robert H.; and Hawthorne, John O., B 390,979.
Thomas, McKinley B., B 563,932.
Walther, Ludwig, B 532,976.
United Technologies Corporation: *See—*
Eastman, Larry B.; and Kenigsberg, Irwin J., B 567,158.
Jensen, Harry T., B 566,556.
University of Notre Dame du Lac: *See—*
D'Alelio, Gaetano F., B 497,490.
Unruh, Dale H.; and Proksch, Frederick D., to Caterpillar Tractor Co. Vehicle provided with a fluidic accelerometer. B 550,810, Cl. 280-124.00F.
Urquhart, Thomas, to Du Pont de Nemours, E. I., and Company. Process for the manufacture of plastic pirn sleeves. B 455,806, Cl. 264-150.000.
Valentine, Donald Herman, Jr.: *See—*
Townsend, John Melvin; and Valentine, Donald Herman, Jr., B 518,326.
Vandeputte, Camille Angelina: *See—*
Pollet, Robert Joseph; Vandeputte, Camille Angelina; Sels, Francis Jeanne; Vanreusel, Gerard Laurens; Willems, Jozef Frans; and van Veelen, George Frans, B 417,498.
van Hesden, Jan Willem, to Borg-Warner Corporation. Non-foaming lubrication oil. B 468,603, Cl. 252-25.000.
Vanreusel, Gerard Laurens: *See—*
Pollet, Robert Joseph; Vandeputte, Camille Angelina; Sels, Francis Jeanne; Vanreusel, Gerard Laurens; Willems, Jozef Frans; and van Veelen, George Frans, B 417,498.
Van Turnhout, Jan, to U.S. Philips Corporation. Electret transducer. B 557,274, Cl. 179-111.00E.
van Veelen, George Frans: *See—*
Pollet, Robert Joseph; Vandeputte, Camille Angelina; Sels, Francis Jeanne; Vanreusel, Gerard Laurens; Willems, Jozef Frans; and van Veelen, George Frans, B 417,498.
Vescia, Michele: *See—*
Greif, Norbert; Vescia, Michele; Daeuble, Manfred; and Heinrich, Hans, B 497,571.
Volkert, Otto; Wigger, August; Zuerger, Manfred; and Richter, Peter, to BASF Aktiengesellschaft. Manufacture of thin layers of polyurethane elastomers. B 421,608, Cl. 427-54.000.
von Susani, Odorich: *See—*
Tanikella, Murty S.; and von Susani, Odorich, B 559,700.
von Susani, Odorick: *See—*
Tanikella, Murty S.; and von Susani, Odorick, B 559,701.
Walther, Ludwig, to United States Steel Corporation. Sliding gate valves. B 532,976, Cl. 222-512.000.
Warner, Richard Burridge: *See—*
Forsyth, Bruce Adam; and Warner, Richard Burridge, B 516,804.
Watts, Golden F.; and Coats, Carlton E. Production of thermoset water-in-oil emulsions. B 326,211, Cl. 260-22.0CB.
Weber, Theodor: *See—*
Wolf, Dieter; Bender, Eberhard; and Weber, Theodor, B 466,304.
Wehinger, Egbert: *See—*
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, B 459,408.
Wigger, August: *See—*
Volkert, Otto; Wigger, August; Zuerger, Manfred; and Richter, Peter, B 421,608.
Willems, Jozef Frans: *See—*
Pollet, Robert Joseph; Vandeputte, Camille Angelina; Sels, Francis Jeanne; Vanreusel, Gerard Laurens; Willems, Jozef Frans; and van Veelen, George Frans, B 417,498.
Wilson, Charles H. Telephone calculator. B 432,049, Cl. 179-90.00K.
Wittlinger, Harold Allen, to RCA Corporation. Ground fault and neutral fault detection circuit. B 534,915, Cl. 317-18.00D.
Wolf, Didier Albert, to Societe Anonyme — Poclain. Public works machine equipped with a bucket unloading device. B 536,403, Cl. 214-90.00R.
Wolf, Dieter; Bender, Eberhard; and Weber, Theodor, to BASF Aktiengesellschaft. Recovery of anhydrous dioxane extractively distilled with diols or alkaholamine. B 466,304, Cl. 203-59.000.
Wolf, Karl; and Egelhof, Dieter, to J. M. Voith, GmbH. Method and apparatus for detecting vertical displacement of an upper slice lip. B 552,629, Cl. 162-198.000.
Wolfrum, Gerhard; and Gold, Heinrich, to Bayer Aktiengesellschaft. Monoazo dyestuffs containing an N-β-1,2,3-triazolylethyl anilino coupling component. B 591,141, Cl. 260-157.000.
Wolfsberger, Manfred: *See—*
Schonberger, Helmut; Wolfsberger, Manfred; and Funke, Walter, B 502,151.
Wulz, Klaus: *See—*
Beyer, Karl-Heinz; Wulz, Klaus; and Kindscher, Wolfgang, B 409,310.
Wurmli, Albert, to Ciba-Geigy Corporation. Reaction products of phenolsulphonic acid-urea-formaldehyde as tanning agents and process for their manufacture. B 520,995, Cl. 8-94.240.
Yamada, Norio: *See—*
Seino, Hiroshi; Yamada, Norio; Kimura, Shigeo; Kosugi, Hideaki; and Yamamoto, Koreyuki, B 380,137.
Yamamoto, Koreyuki: *See—*
Seino, Hiroshi; Yamada, Norio; Kimura, Shigeo; Kosugi, Hideaki; and Yamamoto, Koreyuki, B 380,137.
Yamamoto, Kozo; and Ibi, Takuro, to Matsushita Electric Industrial Co., Ltd. Protection case for tape-recorder or radio-set. B 513,134, Cl. 150-52.00R.
Yasumatsuya, Noboru; and Isobe, Mitsuo. Constant-voltage converter having beam current detector. B 422,156, Cl. 315-379.000.
Yusa, Hideo: *See—*
Kamiya, Kunio; Yusa, Hideo; Nakajima, Fumito; and Takeuchi, Masato, B 428,386.
Zawadzki, Joseph F.: *See—*
Farkas, Walter G.; Hoehn, Willard M.; and Zawadzki, Joseph F., B 485,972.
Zuerger, Manfred: *See—*
Volkert, Otto; Wigger, August; Zuerger, Manfred; and Richter, Peter, B 421,608.

CLASSIFICATION OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM

DATE PUBLISHED MARCH 23, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
Class 8			
1E	B 407,205	C	Mar. 16, 1976
10.2	B 430,334	C	Jan. 27, 1976
14	B 460,388	C	Jan. 27, 1976
	B 497,473	C	Feb. 3, 1976
17	B 458,060	C	Jan. 13, 1976
62	B 507,476	C	Feb. 10, 1976
74	B 354,959	C	Feb. 17, 1976
84	B 495,903	C	Feb. 17, 1976
94.24	B 520,995	C	Mar. 23, 1976
115.5	B 372,232	C	Mar. 16, 1976
115.7	B 389,304	C	Jan. 27, 1976
142	B 423,867	C	Feb. 3, 1976
161	B 461,352	C	Jan. 13, 1976
169	B 497,571	C	Mar. 23, 1976
173	B 537,058	C	Mar. 23, 1976
174	B 344,967	C	Feb. 3, 1976
Class 15			
147A	B 502,667	M	Feb. 24, 1976
229A	B 523,885	M	Feb. 17, 1976
256.53	B 579,116	M	Feb. 3, 1976
302	B 553,629	M	Feb. 24, 1976
Class 16			
125	B 589,687	M	Mar. 23, 1976
128R	B 594,871	M	Mar. 16, 1976
Class 17			
23	B 519,599	M	Feb. 17, 1976
2502	B 541,496	E	Jan. 27, 1976
Class 19			
155	B 569,501	M	Mar. 9, 1976
Class 21			
2.7R	B 527,999	C	Feb. 3, 1976
Class 23			
230B	B 554,039	C	Feb. 24, 1976
273SP	B 431,785	C	Feb. 24, 1976
273V	B 563,165	C	Mar. 9, 1976
285F	B 565,180	C	Jan. 27, 1976
Class 24			
75	B 532,476	M	Feb. 3, 1976
Class 28			
1.6	B 497,292	M	Feb. 3, 1976
Class 29			
96	B 546,911	M	Jan. 13, 1976
127	B 510,855	M	Jan. 27, 1976
180SS	B 421,975	C	Mar. 2, 1976
237	B 503,436	M	Feb. 24, 1976
415	B 504,061	M	Mar. 16, 1976
428	B 520,928	M	Jan. 13, 1976
578	B 561,732	M	Feb. 3, 1976
580	B 492,301	M	Jan. 13, 1976
Class 30			
133	B 581,843	M	Mar. 16, 1976
Class 32			
10A	B 491,501	M	Jan. 13, 1976
Class 33			
174S	B 498,820	M	Mar. 9, 1976
Class 35			
17	B 546,097	M	Mar. 23, 1976
36	B 511,454	M	Feb. 24, 1976
Class 37			
8	B 558,819	M	Feb. 3, 1976
57	B 531,753	M	Mar. 2, 1976
142A	B 511,099	M	Feb. 3, 1976
Class 40			
28C	B 493,981	M	Mar. 9, 1976
159	B 456,153	M	Mar. 9, 1976
Class 43			
129	B 442,866	M	Feb. 24, 1976
Class 44			
2	B 496,792	C	Feb. 17, 1976
62	B 407,812	C	Mar. 23, 1976
Class 47			
1.7	B 491,776	M	Mar. 16, 1976
57.6	0b 548,028	M	Feb. 3, 1976
Class 48			
73	B 541,376	C	Feb. 17, 1976
192	B 593,781	C	Mar. 16, 1976
358	B 576,859	M	Feb. 24, 1976
Class 51			
358	B 576,859	M	Feb. 24, 1976
Class 52			
207	B 459,597	M	Feb. 17, 1976
484	B 522,354	M	Jan. 20, 1976
Class 53			
77	B 508,878	M	Feb. 3, 1976
Class 55			
70	B 456,905	C	Mar. 23, 1976
71	B 570,925	C	Mar. 23, 1976
105	B 490,806	C	Feb. 3, 1976
352	B 543,941	C	Jan. 13, 1976
417	B 502,151	C	Mar. 23, 1976
Class 56			
13.4	B 494,167	M	Mar. 23, 1976
14.5	B 549,244	M	Jan. 27, 1976
15.9	B 558,973	M	Feb. 10, 1976
Class 57			
140BY	B 495,124	M	Mar. 9, 1976
Class 58			
21.13	B 516,825	M	Feb. 3, 1976
Class 60			
226A	B 445,459	M	Feb. 3, 1976
299	B 551,133	M	Mar. 2, 1976
304	B 502,540	M	Jan. 13, 1976
349	B 541,464	M	Feb. 17, 1976
422	B 526,445	M	Jan. 20, 1976
424	B 584,520	M	Jan. 27, 1976
425	B 535,386	M	Jan. 13, 1976
431	B 551,809	M	Feb. 24, 1976
445	B 400,871	M	Feb. 17, 1976
592	B 465,145	M	Jan. 27, 1976
645	B 538,472	M	Feb. 3, 1976
660	B 556,496	M	Mar. 16, 1976
667	B 464,027	M	Mar. 16, 1976
690	B 505,689	M	Mar. 2, 1976
706	B 509,238	M	Feb. 24, 1976
Class 61			
.5	B 554,283	M	Jan. 27, 1976
49	B 504,439	M	Mar. 16, 1976
Class 62			
306	B 522,009	M	Feb. 17, 1976
353	B 564,314	M	Jan. 20, 1976
Class 64			
27L	B 509,043	M	Feb. 24, 1976
Class 65			
3A	B 532,969	C	Jan. 13, 1976
11W	B 557,721	C	Mar. 23, 1976
49	B 517,858	C	Feb. 17, 1976
239	B 545,777	C	Jan. 27, 1976
Class 66			
116	B 438,882	M	Feb. 24, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
Class 71			
113	B 535,076	C	Jan. 20, 1976
Class 72			
43	B 546,631	M	Feb. 3, 1976
56	B 489,290	M	Feb. 17, 1976
88	B 575,757	M	Jan. 27, 1976
238	B 563,932	M	Mar. 23, 1976
391	B 516,537	M	Feb. 17, 1976
Class 73			
9	B 573,994	M	Mar. 23, 1976
24	B 506,744	M	Jan. 13, 1976
29	B 557,153	M	Feb. 3, 1976
37.7	B 532,319	M	Feb. 3, 1976
61.1R	B 511,909	M	Feb. 17, 1976
67.5H	B 522,309	M	Feb. 3, 1976
116	B 569,859	M	Mar. 9, 1976
147	B 521,620	M	Jan. 27, 1976
190R	B 480,350	M	Feb. 10, 1976
302	B 463,473	M	Mar. 23, 1976
	B 464,290	M	Feb. 3, 1976
422GC	B 490,547	M	Feb. 24, 1976
432R	B 415,021	M	Mar. 2, 1976
437	B 528,401	M	Feb. 3, 1976
557	B 523,080	M	Feb. 17, 1976
Class 74			
18.2	B 501,975	M	Mar. 2, 1976
242.1A	B 567,854	M	Feb. 3, 1976
243C	B 558,818	M	Jan. 13, 1976
424.8VA	B 499,786	M	Mar. 16, 1976
479	B 509,586	M	Feb. 3, 1976
481	B 497,021	M	Jan. 13, 1976
482	B 525,809	M	Feb. 24, 1976
527	B 470,170	M	Jan. 13, 1976
546	B 518,999	M	Feb. 3, 1976
765	B 500,945	M	Feb. 24, 1976
Class 75			
.5BA	B 385,631	C	Jan. 27, 1976
84.1R	B 538,491	C	Feb. 17, 1976
101BE	B 452,938	C	Feb. 17, 1976
135	B 525,961	C	Jan. 13, 1976
156.5	B 411,471	C	Feb. 17, 1976
165	B 483,256	C	Feb. 10, 1976
Class 83			
61	B 570,862	M	Feb. 24, 1976
425	B 545,935	M	Jan. 27, 1976
Class 84			
1.1	B 476,568	E	Mar. 16, 1976
1.16	B 556,897	M	Feb. 3, 1976
275	B 504,169	M	Jan. 13, 1976
Class 86			
1R	B 356,187	M	Jan. 20, 1976
Class 89			
142	B 470,853	M	Mar. 23, 1976
Class 91			
40	B 410,694	M	Mar. 23, 1976
Class 92			
163	B 425,193	M	Mar. 23, 1976
Class 93			
58.3	B 548,978	M	Mar. 9, 1976
Class 96			
1R	B 423,883	C	Jan. 27, 1976
1.4	B 200,759	C	Feb. 3, 1976
33	B 437,894	C	Mar. 2, 1976
35	B 524,026	C	Feb. 10, 1976
35.1	B 420,176	C	Mar. 16, 1976
	B 462,893	C	Feb. 24, 1976
	B 530,873	C	Feb. 17, 1976
36.1	B 359,901	C	Jan. 13, 1976
45	B 455,759	C	Feb. 24, 1976
54	B 367,305	C	Mar. 2, 1976
66.3	B 417,498	C	Mar. 23, 1976
78	B 503,029	C	Jan. 27, 1976
Class 99			
162B	B 432,991	M	Mar. 2, 1976
335	B 557,299	M	Feb. 3, 1976
485	B 311,450	M	Mar. 9, 1976
Class 101			
93.13	B 496,999	M	Jan. 27, 1976
93.14	B 481,600	M	Jan. 27, 1976
115	B 395,554	M	Mar. 9, 1976
129	B 416,589	M	Jan. 27, 1976
401.3	B 494,234	M	Feb. 10, 1976
Class 102			
32	B 405,726	M	Jan. 13, 1976
38	B 279,415	M	Mar. 16, 1976
39	B 417,349	M	Mar. 9, 1976
42R	B 443,163	M	Feb. 3, 1976
69	B 412,068	M	Jan. 13, 1976
Class 106			
1	B 466,419	C	Mar. 23, 1976
27	B 452,883	C	Jan. 27, 1976
47R	B 581,564	C	Mar. 23, 1976
57	B 502,773	C	Jan. 13, 1976
58	B 750,679	C	Mar. 23, 1976
213	B 432,265	C	Mar. 23, 1976
309	B 311,779	C	Feb. 10, 1976
316	B 503,776	C	Mar. 23, 1976
Class 109			
1SB	B 358,427	E	Feb. 3, 1976
Class 110			
8R	B 512,324	M	Feb. 17, 1976
Class 114			
16.6	B 546,922	M	Mar. 16, 1976
67A	B 489,550	M	Mar. 16, 1976
144R	B 529,659	M	Feb. 24, 1976
230	B 484,769	M	Mar. 16, 1976
	B 503,456	M	Mar. 23, 1976
Class 116			
124L	B 469,228	M	Feb. 17, 1976
124.4	B 467,412	M	Jan. 13, 1976
Class 118			
637	B 563,301	M	Feb. 17, 1976
Class 123			
8.45	B 570,172	M	Feb. 3, 1976
25R	B 447,440	M	Feb. 17, 1976
32SP	B 467,486	M	Mar. 16, 1976
75B	B 563,780	M	Feb. 3, 1976
119A	B 405,899	M	Mar. 23, 1976
122AC	B 498,951	M	Mar. 2, 1976
139AW	B 480,251	M	Mar. 23, 1976
148E	B 480,473	M	Mar. 2, 1976
182	B 558,251	M	Jan. 13, 1976
191S	B 466,906	M	Mar. 16, 1976
325T	B 425,588	M	Jan. 13, 1976
Class 126			
271	B 512,745	M	Jan. 13, 1976
350A	B 537,903	M	Jan. 20, 1976
Class 128			
2.6R	B 534,574	M	Feb. 24, 1976
260	B 520,277	M	Feb. 17, 1976
	B 524,121	M	Feb. 3, 1976
419P	B 535,466	M	Jan. 27, 1976
419PG	B 533,259	M	Feb. 24, 1976
Class 131			
144	B 586,387	M	Feb. 3, 1976
514.4	B 586,380	M	Mar. 2, 1976
Class 136			
26	B 511,665	C	Mar. 2, 1976
86R	B 505,126	C	Feb. 10, 1976
	B 574,128	C	Feb. 17, 1976
89	B 510,677	C	Feb. 24, 1976
148	B 524,464	C	Feb. 10, 1976
202	B 378,513	C	Jan. 27, 1976
205	B 399,632	C	Mar. 9, 1976
Class 137			
255	B 508,940	M	Feb. 17, 1976
596.12	B 514,687	M	Jan. 27, 1976
608	B 490,623	M	Mar. 2, 1976
614.11	B 530,605	M	Feb. 3, 1976
625.46	B 528,756	M	Feb. 3, 1976
798	B 430,172	M	Jan. 13, 1976
Class 139			
122R	B 527,171	M	Mar. 9, 1976
Class 140			
92.1	B 590,158	M	Feb. 10, 1976
	B 590,159	M	Feb. 3, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
Class 141			
294	B 473,813	M	Mar. 9, 1976
Class 144			
32R	B 484,332	M	Mar. 2, 1976
34R	B 521,793	M	Feb. 24, 1976
241	B 545,630	M	Jan. 27, 1976
Class 148			
1.5	B 518,226	C	Feb. 10, 1976
23	B 527,972	C	Mar. 9, 1976
36	B 459,381	C	Mar. 9, 1976
175	B 105,006	C	Mar. 23, 1976
187	B 554,164	C	Mar. 9, 1976
Class 150			
3	B 461,250	M	Mar. 16, 1976
52R	B 513,134	M	Mar. 23, 1976
Class 152			
213R	B 445,690	M	Feb. 3, 1976
Class 156			
3	B 453,031	C	Mar. 16, 1976
	B 563,722	C	Jan. 13, 1976
66	B 497,584	C	Feb. 24, 1976
71	B 456,148	C	Jan. 13, 1976
73.6	B 414,481	C	Jan. 20, 1976
143	B 462,386	C	Jan. 13, 1976
159	B 339,446	C	Feb. 24, 1976
435	B 475,385	C	Mar. 9, 1976
608	B 584,997	C	Mar. 9, 1976
Class 160			
229R	B 505,813	M	Jan. 13, 1976
Class 162			
5	B 491,673	C	Feb. 17, 1976
133	B 431,072	C	Jan. 20, 1976
198	B 150,142	C	Jan. 27, 1976
	B 552,629	C	Mar. 23, 1976
290	B 478,739	C	Feb. 17, 1976
Class 164			
26	B 499,227	M	Jan. 27, 1976
57	B 488,756	M	Mar. 16, 1976
60	B 511,885	M	Jan. 27, 1976
282	B 396,916	M	Mar. 2, 1976
330	B 522,038	M	Feb. 3, 1976
Class 165			
4	B 328,116	M	Mar. 9, 1976
13	B 543,078	M	Feb. 17, 1976
32	B 529,194	C	Mar. 23, 1976
Class 166			
224	B 492,120	M	Feb. 24, 1976
272	B 569,519	M	Feb. 3, 1976
303	B 529,836	M	Feb. 3, 1976
311	B 511,156	M	Jan. 27, 1976
Class 172			
719	B 97,259	M	Mar. 9, 1976
Class 173			
104	B 537,709	M	Jan. 13, 1976
170	B 567,058	M	Jan. 13, 1976
Class 174			
52R	B 492,902	E	Feb. 24, 1976
68.5	B 509,772	E	Mar. 16, 1976
Class 176			
20R	B 384,330	C	Jan. 27, 1976
36R	B 367,621	C	Feb. 3, 1976
68	B 396,164	C	Feb. 3, 1976
Class 178			
6	B 546,426	E	Jan. 27, 1976
7.1	B 468,100	E	Mar. 9, 1976
	B 519,979	E	Feb. 3, 1976
7.3D	B 442,970	E	Feb. 3, 1976
7.3DC	B 561,770	E	Mar. 16, 1976
7.5R	B 508,817	E	Feb. 3, 1976
58R	B 399,908	C	Jan. 13, 1976
66R	B 498,775	E	Mar. 2, 1976
70R	B 559,631	E	Mar. 23, 1976
88	B 561,764	E	Jan. 27, 1976
Class 179			
1A	B 513,756	E	Feb. 3, 1976
1CN	B 475,681	E	Jan. 20, 1976
1SM	B 476,577	E	Jan. 20, 1976
1G	B 554,594	E	Jan. 20, 1976
1.5FS	B 504,899	E	Mar. 9, 1976
2DP	B 462,030	E	Mar. 23, 1976
7.1R	B 545,050	E	Jan. 20, 1976
15AL	B 496,500	E	Feb. 3, 1976
81R	B 472,284	E	Jan. 13, 1976
90K	B 432,049	E	Mar. 23, 1976
111E	B 557,274	E	Mar. 23, 1976
170D	B 541,415	E	Feb. 3, 1976
Class 180			
5R	B 499,171	M	Jan. 27, 1976
44F	B 432,969	M	Mar. 2, 1976
49	B 433,094	M	Jan. 27, 1976
53R	B 551,527	M	Jan. 13, 1976
79.2R	B 533,968	M	Jan. 27, 1976
103	B 490,647	M	Feb. 24, 1976
Class 187			
1R	B 436,724	M	Feb. 24, 1976
Class 188			
71.1	B 535,411	M	Feb. 24, 1976
73.6	B 533,056	M	Jan. 13, 1976
165	B 567,435	M	Feb. 3, 1976
218XL	B 562,698	M	Jan. 13, 1976
Class 192			
3.57	B 548,719	M	Feb. 17, 1976
4A	B 531,267	M	Feb. 24, 1976
46	B 522,080	M	Mar. 16, 1976
Class 195			
1.8	B 530,255	E	Mar. 2, 1976
	B 514,839	C	Mar. 2, 1976
29	B 418,489	C	Jan. 13, 1976
31R	B 493,463	C	Mar. 23, 1976
65	B 566,585	C	Mar. 2, 1976
	B 592,146	C	Mar. 2, 1976
68	B 395,975	C	Mar. 2, 1976
80R	B 527,040	C	Mar. 23, 1976
103.5R	B 452,879	C	Mar. 16, 1976
Class 196			
14.52	B 520,384	M	Jan. 27, 1976
Class 197			
17	B 501,122	M	Feb. 17, 1976
18	B 535,391	M	Jan. 27, 1976
Class 198			
38	B 495,402	M	Feb. 17, 1976
129	B 503,521	M	Mar. 16, 1976
	B 569,646	M	Jan. 13, 1976
179	B 424,989	M	Feb. 3, 1976
202	B 499,352	M	Jan. 27, 1976
Class 200			
5R	B 579,104	E	Jan. 27, 1976
11TC	B 531,425	E	Feb. 3, 1976
16C	B 480,740	E	Mar. 2, 1976
38FA	B 494,383	E	Feb. 3, 1976
61.41	B 506,286	E	Jan. 20, 1976
67D	B 585,247	E	Feb. 3, 1976
83SA	B 428,877	E	Jan. 27, 1976
84C	B 453,533	E	Feb. 17, 1976
309	B 470,899	E	Mar. 2, 1976
339	B 466,390	E	Feb. 24, 1976
Class 202			
227	B 513,280	C	Jan. 20, 1976
Class 203			
59	B 466,304	C	Mar. 23, 1976
73	B 441,543	C	Mar. 23, 1976
Class 204			
9	B 462,424	C	Feb. 24, 1976
15	B 542,135	C	Feb. 10, 1976
158HA	B 550,744	C	Feb. 17, 1976
159.16	B 476,776	C	Mar. 23, 1976
159.18	B 498,205	C	Feb. 10, 1976
159.22	B 423,404	C	Mar. 2, 1976
162R	B 354,222	C	Mar. 23, 1976
163R	B 526,447	C	Feb. 24, 1976
181	B 167,470	C	Mar. 2, 1976
186	B 589,179	C	Mar. 23, 1976
195P	B 511,002	C	Mar. 2, 1976
195S	B 843,038	C	Feb. 3, 1976
224M	B 534,314	C	Feb. 10, 1976
252	B 542,258	C	Mar. 23, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
Class 206			
451	B 371,912	M	Mar. 2, 1976
455	B 490,067	M	Jan. 27, 1976
Class 208			
15	B 437,596	C	Jan. 27, 1976
59	B 508,118	C	Feb. 17, 1976
78	B 467,250	C	Feb. 3, 1976
208R	B 508,119	C	Feb. 17, 1976
210	B 501,317	C	Jan. 13, 1976
253	B 438,916	C	Jan. 13, 1976
Class 210			
22R	B 525,204	C	Mar. 16, 1976
23H	B 364,797	C	Feb. 17, 1976
	B 524,806	C	Mar. 2, 1976
24	B 452,501	C	Mar. 16, 1976
84	B 356,470	C	Mar. 23, 1976
130	B 532,901	C	Jan. 13, 1976
189	B 492,716	C	Mar. 2, 1976
321A	B 470,601	C	Mar. 9, 1976
500M	B 433,930	C	Mar. 23, 1976
	B 493,474	C	Mar. 23, 1976
512R	B 330,719	C	Mar. 16, 1976
Class 214			
1C	B 453,238	M	Mar. 2, 1976
18N	B 373,344	M	Feb. 3, 1976
58	B 555,772	M	Jan. 13, 1976
90R	B 536,403	M	Mar. 23, 1976
152	B 480,604	M	Jan. 13, 1976
Class 215			
216	B 541,015	M	Jan. 27, 1976
Class 219			
69M	B 426,227	E	Mar. 2, 1976
121EM	B 479,502	E	Mar. 16, 1976
201	B 451,248	E	Mar. 2, 1976
233	B 463,388	E	Feb. 10, 1976
273	B 403,507	E	Feb. 10, 1976
553	B 513,027	E	Feb. 17, 1976
Class 220			
23.83	B 529,156	M	Jan. 13, 1976
66	B 223,678	M	Mar. 9, 1976
288	B 516,032	M	Jan. 27, 1976
337	B 578,447	M	Jan. 20, 1976
Class 221			
75	B 510,281	M	Mar. 9, 1976
Class 222			
43	B 497,853	M	Feb. 17, 1976
56	B 559,697	M	Mar. 16, 1976
67	B 521,480	M	Jan. 13, 1976
136	B 487,260	M	Jan. 27, 1976
181	B 562,601	M	Mar. 16, 1976
306	B 559,954	M	Feb. 3, 1976
325	B 515,303	M	Jan. 20, 1976
512	B 532,976	M	Mar. 23, 1976
Class 226			
1	B 506,624	M	Mar. 9, 1976
21	B 504,778	M	Feb. 24, 1976
68	B 506,926	M	Feb. 17, 1976
Class 228			
190	B 473,972	M	Jan. 13, 1976
Class 229			
2.5	B 537,990	M	Jan. 13, 1976
17R	B 461,257	M	Jan. 13, 1976
62.5	B 429,157	M	Jan. 27, 1976
Class 235			
151	B 491,650	E	Mar. 9, 1976
151.1	B 520,063	E	Mar. 2, 1976
	B 520,075	E	Feb. 24, 1976
	B 520,076	E	Mar. 2, 1976
	B 520,082	E	Mar. 23, 1976
151.11	B 540,767	E	Mar. 16, 1976
151.12	B 504,156	E	Mar. 23, 1976
151.34	B 492,946	E	Jan. 27, 1976
152	B 484,121	E	Mar. 16, 1976
	B 559,737	E	Jan. 20, 1976
153AK	B 563,419	E	Mar. 23, 1976
153AM	B 587,936	E	Mar. 23, 1976
154	B 534,016	E	Feb. 3, 1976
156	B 536,009	E	Jan. 27, 1976
175	B 560,488	E	Mar. 16, 1976
181	B 520,924	E	Jan. 27, 1976
Class 236			
13	B 502,652	M	Feb. 24, 1976
15A	B 558,813	M	Feb. 3, 1976
Class 239			
265.39	B 567,892	M	Mar. 16, 1976
424	B 580,921	M	Jan. 13, 1976
	B 586,215	M	Jan. 20, 1976
652	B 520,534	M	Feb. 17, 1976
Class 240			
41.35R	B 454,283	E	Feb. 3, 1976
Class 241			
46.11	B 462,828	M	Mar. 9, 1976
81	B 425,462	M	Mar. 9, 1976
Class 242			
43R	B 521,600	M	Jan. 27, 1976
56R	B 535,448	M	Mar. 16, 1976
107.4A	B 487,427	M	Mar. 2, 1976
129.8	B 506,167	M	Feb. 10, 1976
Class 244			
3.27	B 510,521	M	Mar. 2, 1976
134R	B 535,928	M	Jan. 13, 1976
140	B 419,173	M	Mar. 9, 1976
169	B 423,441	M	Feb. 17, 1976
	B 511,346	M	Jan. 27, 1976
Class 248			
49	B 398,488	M	Feb. 24, 1976
73	B 494,806	M	Feb. 3, 1976
205R	B 520,952	M	Mar. 16, 1976
309R	B 527,333	M	Mar. 23, 1976
Class 249			
135	B 548,155	M	Jan. 13, 1976
Class 250			
210	B 515,908	E	Jan. 20, 1976
227	B 522,577	E	Jan. 27, 1976
	B 560,765	E	Feb. 3, 1976
231SE	B 503,618	E	Mar. 9, 1976
291	B 500,981	E	Jan. 27, 1976
303	B 536,082	E	Mar. 16, 1976
310	B 485,926	E	Mar. 23, 1976
328	B 71,613	E	Mar. 16, 1976
364	B 526,190	E	Feb. 17, 1976
402	B 451,534	E	Jan. 13, 1976
445T	B 574,616	E	Mar. 2, 1976
564	B 566,572	E	Mar. 16, 1976
577	B 507,396	E	Feb. 10, 1976
Class 251			
1B	B 541,710	M	Feb. 24, 1976
28	B 480,384	M	Mar. 23, 1976
58	B 429,434	M	Feb. 17, 1976
129	B 534,333	M	Feb. 17, 1976
319	B 490,589	M	Feb. 3, 1976
Class 252			
12	B 559,142	C	Mar. 2, 1976
12.2	B 380,137	C	Mar. 23, 1976
25	B 468,603	C	Mar. 23, 1976
33.6	B 441,723	C	Mar. 16, 1976
105	B 479,969	C	Mar. 9, 1976
106	B 530,303	C	Mar. 23, 1976
156	B 520,546	C	Mar. 2, 1976
182	B 471,405	C	Feb. 10, 1976
301.1W	B 548,058	C	Feb. 17, 1976
301.4S	B 535,813	C	Jan. 27, 1976
301.2W	B 528,297	C	Mar. 16, 1976
364	B 370,309	C	Jan. 20, 1976
404	B 569,125	C	Feb. 24, 1976
408R	B 544,476	C	Feb. 24, 1976
429R	B 457,850	C	Feb. 10, 1976
432	B 509,640	C	Feb. 17, 1976
454	B 450,967	C	Jan. 13, 1976
455R	B 390,979	C	Mar. 23, 1976
500	B 479,242	C	Feb. 17, 1976
514	B 553,421	C	Mar. 23, 1976
518	B 585,731	C	Feb. 3, 1976
543	B 403,766	C	Feb. 10, 1976
544	B 433,707	C	Mar. 23, 1976
Class 254			
186R	B 511,407	M	Feb. 10, 1976
188	B 437,559	M	Feb. 3, 1976
190R	B 489,685	M	Feb. 24, 1976
Class 259			
4	B 486,614	N	Feb. 17, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
8	B 547,016	M	Mar. 23, 1976
191	B 397,674	M	Mar. 16, 1976
	B 556,057	M	Jan. 13, 1976
Class 260			
2.5AC	B 497,194	C	Feb. 3, 1976
	B 537,102	C	Jan. 13, 1976
2.5AJ	B 557,856	C	Feb. 10, 1976
2.5AM	B 422,063	C	Feb. 3, 1976
2.5AR	B 483,606	C	Jan. 27, 1976
	B 502,589	C	Jan. 27, 1976
2.5AV	B 460,441	C	Jan. 13, 1976
2.5AW	B 483,762	C	Feb. 10, 1976
	B 486,828	C	Mar. 2, 1976
2.5B	B 554,380	C	Mar. 9, 1976
2.5R	B 471,579	C	Jan. 13, 1976
17R	B 510,998	C	Feb. 10, 1976
	B 519,487	C	Feb. 17, 1976
17.4ST	B 530,580	C	Mar. 2, 1976
18TN	B 528,303	C	Feb. 10, 1976
23H	B 54,859	C	Feb. 17, 1976
23XA	B 483,865	C	Jan. 13, 1976
28P	B 489,331	C	Feb. 17, 1976
28R	B 507,456	C	Mar. 9, 1976
28.5AS	B 501,540	C	Jan. 13, 1976
29.2EP	B 455,686	C	Mar. 2, 1976
	B 522,629	C	Mar. 16, 1976
	B 526,997	C	Jan. 13, 1976
29.2TN	B 414,266	C	Feb. 10, 1976
29.6F	B 567,076	C	Mar. 23, 1976
29.6N	B 494,440	C	Feb. 17, 1976
29.6TA	B 494,450	C	Feb. 17, 1976
30.4R	B 485,060	C	Feb. 17, 1976
31.8N	B 592,658	C	Mar. 23, 1976
32.6R	B 596,692	C	Feb. 17, 1976
33.6AQ	B 520,658	C	Mar. 9, 1976
	B 657,438	C	Jan. 20, 1976
33.6R	B 479,175	C	Feb. 17, 1976
33.6UA	B 559,441	C	Mar. 23, 1976
33.8UA	B 497,780	C	Feb. 24, 1976
	B 570,721	C	Mar. 23, 1976
37EP	B 423,365	C	Feb. 17, 1976
	B 441,605	C	Feb. 3, 1976
37R	B 465,955	C	Feb. 3, 1976
40P	B 485,188	C	Mar. 16, 1976
40R	B 590,502	C	Mar. 23, 1976
42.15	B 257,143	C	Mar. 16, 1976
	B 415,122	C	Feb. 10, 1976
42.18	B 519,095	C	Feb. 24, 1976
45.75W	B 561,387	C	Feb. 10, 1976
45.8N	B 506,648	C	Feb. 3, 1976
45.8R	B 479,556	C	Mar. 23, 1976
45.85R	B 236,342	C	Feb. 10, 1976
46.5UA	B 528,962	C	Feb. 24, 1976
	B 528,966	C	Feb. 24, 1976
47EP	B 440,633	C	Feb. 10, 1976
47EQ	B 444,078	C	Mar. 23, 1976
47UP	B 493,537	C	Mar. 23, 1976
63UY	B 470,576	C	Feb. 24, 1976
75N	B 521,125	C	Feb. 10, 1976
	B 521,126	C	Feb. 10, 1976
	B 521,127	C	Feb. 17, 1976
	B 521,128	C	Feb. 10, 1976
	B 552,489	C	Feb. 10, 1976
	B 559,700	C	Mar. 23, 1976
	B 559,701	C	Mar. 23, 1976
75R	B 236,266	C	Mar. 23, 1976
77.5AN	B 474,645	C	Mar. 2, 1976
77.5CR	B 306,668	C	Feb. 3, 1976
78S	B 451,308	C	Feb. 17, 1976
78.5R	B 437,209	C	Feb. 3, 1976
78UA	B 497,490	C	Mar. 23, 1976
79.5P	B 546,149	C	Mar. 2, 1976
80.78	B 271,743	C	Mar. 16, 1976
82.1	B 443,563	C	Feb. 24, 1976
88.2C	B 417,014	C	Jan. 13, 1976
88.2F	B 632,416	C	Mar. 9, 1976
93.5A	B 530,174	C	Feb. 24, 1976
112.5R	B 471,617	C	Feb. 10, 1976
	B 485,972	C	Mar. 23, 1976
	B 503,817	C	Jan. 13, 1976
	B 520,514	C	Mar. 9, 1976
117	B 333,247	C	Mar. 16, 1976
140R	B 503,579	C	Feb. 10, 1976
143	B 419,582	C	Mar. 2, 1976
147	B 383,697	C	Feb. 17, 1976
156	B 411,624	C	Mar. 16, 1976
157	B 591,141	C	Mar. 23, 1976
210AB	B 554,291	C	Mar. 9, 1976
220B	B 326,211	C	Mar. 23, 1976
239A	B 349,370	C	Jan. 27, 1976
239B	B 470,900	C	Mar. 2, 1976
239BC	B 403,326	C	Mar. 23, 1976
239D	B 382,120	C	Mar. 23, 1976
	B 487,423	C	Mar. 2, 1976
	B 520,256	C	Jan. 13, 1976
	B 536,935	C	Jan. 13, 1976
239.1	B 371,095	C	Mar. 23, 1976
	B 372,016	C	Mar. 9, 1976
	B 538,753	C	Feb. 10, 1976
	B 547,208	C	Feb. 24, 1976
239.3A	B 506,148	C	Feb. 3, 1976
240A	B 484,067	C	Feb. 17, 1976
240G	B 482,709	C	Feb. 24, 1976
240R	B 491,711	C	Mar. 23, 1976
243C	B 442,810	C	Feb. 24, 1976
	B 473,039	C	Feb. 10, 1976
	B 473,040	C	Feb. 10, 1976
	B 516,047	C	Feb. 10, 1976
	B 516,296	C	Feb. 3, 1976
	B 526,096	C	Feb. 3, 1976
244R	B 348,433	C	Feb. 3, 1976
247.1R	B 457,931	C	Mar. 16, 1976
247.7T	B 468,052	C	Feb. 10, 1976
248AS	B 514,259	C	Mar. 23, 1976
248NS	B 537,711	C	Jan. 13, 1976
249.6	B 344,669	C	Mar. 16, 1976
250BC	B 491,883	C	Feb. 3, 1976
250P	B 498,288	C	Mar. 23, 1976
251A	B 480,625	C	Feb. 24, 1976
256.4C	B 435,617	C	Mar. 16, 1976
256.4Q	B 503,345	C	Feb. 24, 1976
256.5R	B 531,096	C	Feb. 10, 1976
268BF	B 490,946	C	Feb. 17, 1976
268TR	B 539,374	C	Mar. 9, 1976
	B 563,070	C	Mar. 9, 1976
274SA	B 494,944	C	Feb. 17, 1976
285.5	B 530,318	C	Jan. 13, 1976
287C	B 492,039	C	Feb. 24, 1976
287D	B 571,638	C	Mar. 9, 1976
288R	B 402,162	C	Mar. 2, 1976
290HL	B 537,053	C	Mar. 23, 1976
290R	B 445,493	C	Mar. 2, 1976
293.52	B 552,508	C	Mar. 16, 1976
293.54	B 545,464	C	Feb. 10, 1976
293.56	B 447,000	C	Feb. 3, 1976
293.57	B 426,802	C	Feb. 17, 1976
294.8D	B 526,510	C	Jan. 20, 1976
294.8G	B 445,166	C	Mar. 2, 1976
294.9	B 494,339	C	Mar. 16, 1976
295.5A	B 515,642	C	Feb. 24, 1976
	B 545,299	C	Feb. 24, 1976
295.5B	B 458,617	C	Feb. 3, 1976
296R	B 429,027	C	Mar. 23, 1976
	B 477,252	C	Jan. 13, 1976
306.7C	B 385,024	C	Feb. 10, 1976
307D	B 486,280	C	Feb. 3, 1976
307H	B 471,836	C	Feb. 24, 1976
	B 554,848	C	Feb. 24, 1976
308A	B 488,111	C	Jan. 13, 1976
308D	B 532,005	C	Feb. 24, 1976
308R	B 471,494	C	Mar. 16, 1976
309.2	B 407,014	C	Mar. 16, 1976
	B 522,567	C	Feb. 17, 1976
	B 542,158	C	Jan. 13, 1976
309.6	B 521,025	C	Mar. 23, 1976
310R	B 535,437	C	Feb. 24, 1976
314.5	B 426,266	C	Mar. 2, 1976
325PH	B 440,548	C	Mar. 16, 1976
325R	B 427,946	C	Mar. 23, 1976
326HL	B 536,322	C	Mar. 23, 1976
326R	B 486,678	C	Mar. 2, 1976
	B 398,084	C	Feb. 3, 1976
326.5B	B 276,026	C	Feb. 3, 1976
326.5FN	B 484,269	C	Feb. 10, 1976
326.9	B 477,481	C	Feb. 3, 1976
326.12R	B 446,107	C	Mar. 9, 1976
326.13R	B 456,869	C	Mar. 9, 1976
327C	B 480,452	C	Feb. 10, 1976
330.5	B 552,498	C	Jan. 13, 1976
	B 574,996	C	Feb. 17, 1976
340.5	B 504,877	C	Feb. 24, 1976
340.9	B 476,372	C	Feb. 24, 1976
	B 521,643	C	Mar. 2, 1976
343.2R	B 491,032	C	Feb. 10, 1976
343.3	B 536,675	C	Jan. 20, 1976
343.3R	B 495,550	C	Feb. 3, 1976
	B 495,554	C	Feb. 3, 1976
345.9	B 450,701	C	Mar. 16, 1976
	B 450,708	C	Mar. 9, 1976
346.2M	B 440,858	C	Feb. 3, 1976
	B 302,160	C	Feb. 3, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
346.4	B 485,051	C	Feb. 17, 1976
346.8R	B 369,373	C	Mar. 23, 1976
348.5L	B 521,324	C	Jan. 27, 1976
348.6	B 546,295	C	Jan. 20, 1976
378	B 431,713	C	Feb. 10, 1976
397.4	B 450,693	C	Mar. 9, 1976
	B 484,068	C	Mar. 2, 1976
408	B 442,953	C	Mar. 23, 1976
429.7	B 464,587	C	Feb. 3, 1976
429.9	B 455,481	C	Feb. 24, 1976
438.1	B 518,656	C	Feb. 17, 1976
448R	B 495,781	C	Mar. 23, 1976
448.2H	B 390,408	C	Feb. 3, 1976
448.2N	B 551,463	C	Feb. 17, 1976
449M	B 521,985	C	Mar. 23, 1976
456NS	B 484,419	C	Mar. 9, 1976
465.3	B 159,570	C	Mar. 23, 1976
465.5R	B 747,785	C	Feb. 10, 1976
465.7	B 564,252	C	Mar. 2, 1976
465.9	B 456,900	C	Feb. 3, 1976
	B 530,925	C	Feb. 24, 1976
471R	B 385,483	C	Feb. 17, 1976
	B 388,521	C	Jan. 13, 1976
472	B 472,256	C	Jan. 13, 1976
	B 491,052	C	Mar. 2, 1976
473S	B 532,140	C	Mar. 2, 1976
479C	B 483,746	C	Mar. 23, 1976
483	B 410,074	C	Feb. 24, 1976
493	B 351,455	C	Feb. 24, 1976
501.12	B 544,899	C	Feb. 17, 1976
513R	B 494,669	C	Feb. 3, 1976
514D	B 494,138	C	Mar. 23, 1976
514J	B 442,431	C	Mar. 23, 1976
515A	B 390,031	C	Jan. 13, 1976
516	B 386,828	C	Feb. 3, 1976
527R	B 467,328	C	Mar. 9, 1976
534R	B 301,143	C	Jan. 27, 1976
535P	B 426,157	C	Mar. 23, 1976
544C	B 471,116	C	Feb. 17, 1976
545R	B 357,526	C	Mar. 23, 1976
553R	B 391,473	C	Mar. 2, 1976
554	B 529,974	C	Feb. 17, 1976
557R	B 386,257	C	Feb. 3, 1976
561R	B 513,781	C	Feb. 24, 1976
562B	B 413,379	C	Mar. 9, 1976
565	B 533,652	C	Mar. 23, 1976
566A	B 513,014	C	Feb. 10, 1976
566R	B 421,373	C	Mar. 23, 1976
567.6M	B 480,114	C	Mar. 2, 1976
568	B 529,974	C	Feb. 17, 1976
578	B 449,837	C	Mar. 2, 1976
580	B 503,742	C	Feb. 17, 1976
586C	B 438,484	C	Feb. 17, 1976
591	B 416,257	C	Mar. 16, 1976
593R	B 468,350	C	Jan. 13, 1976
598	B 465,202	C	Feb. 24, 1976
	B 524,849	C	Mar. 23, 1976
601R	B 208,916	C	Jan. 13, 1976
604HF	B 472,241	C	Feb. 17, 1976
606.5P	B 518,326	C	Mar. 23, 1976
609E	B 474,573	C	Jan. 20, 1976
615A	B 409,310	C	Mar. 23, 1976
621H	B 501,128	C	Feb. 24, 1976
621K	B 470,348	C	Jan. 13, 1976
632R	B 553,584	C	Feb. 17, 1976
637R	B 519,446	C	Feb. 24, 1976
643R	B 480,662	C	Mar. 2, 1976
647	B 394,248	C	Jan. 27, 1976
648F	B 330,736	C	Feb. 3, 1976
665R	B 460,846	C	Feb. 24, 1976
668D	B 430,157	C	Feb. 17, 1976
674SA	B 426,274	C	Jan. 20, 1976
683.15D	B 428,103	C	Feb. 10, 1976
683.48	B 526,027	C	Feb. 17, 1976
859R	B 519,485	C	Feb. 10, 1976
873	B 465,688	C	Jan. 27, 1976
	B 519,486	C	Feb. 17, 1976
876B	B 575,851	C	Feb. 10, 1976
876R	B 589,966	C	Feb. 17, 1976
	B 461,184	C	Feb. 17, 1976
	B 580,826	C	Feb. 17, 1976
	B 589,966	C	Feb. 17, 1976
878R	B 469,468	C	Mar. 16, 1976
880B	B 510,458	C	Feb. 10, 1976
884	B 456,579	C	Feb. 10, 1976
890	B 495,408	C	Feb. 3, 1976
900	B 564,902	C	Mar. 23, 1976
927N	B 369,221	C	Feb. 24, 1976
929	B 502,993	C	Feb. 17, 1976
937	B 512,373	C	Feb. 10, 1976
940	B 496,430	C	Feb. 10, 1976
942	B 386,673	C	Feb. 3, 1976
948	B 534,591	C	Feb. 17, 1976
984	B 455,486	C	Mar. 16, 1976
Class 261			
39A	B 562,462	C	Jan. 13, 1976
98	B 480,702	C	Jan. 27, 1976
Class 264			
36	B 308,659	C	Jan. 27, 1976
49	B 417,164	C	Mar. 2, 1976
51	B 506,144	C	Feb. 10, 1976
	B 508,369	C	Jan. 13, 1976
140	B 214,925	C	Mar. 9, 1976
150	B 455,806	C	Mar. 23, 1976
161	B 555,437	C	Feb. 3, 1976
225	B 453,759	C	Jan. 27, 1976
315	B 485,169	C	Mar. 16, 1976
Class 270			
62	B 516,609	M	Feb. 24, 1976
Class 271			
180	B 435,481	M	Mar. 9, 1976
Class 274			
37	B 526,388	M	Feb. 3, 1976
Class 277			
27	B 544,034	M	Feb. 17, 1976
34.6	B 430,326	M	Mar. 23, 1976
81P	B 515,216	M	Feb. 17, 1976
184	B 426,819	M	Feb. 17, 1976
Class 280			
11.35R	B 435,570	M	Mar. 16, 1976
124F	B 471,706	M	Mar. 16, 1976
	B 550,810	M	Mar. 23, 1976
150AB	B 520,341	M	Mar. 16, 1976
150.5	B 583,051	M	Feb. 3, 1976
236	B 572,642	M	Feb. 10, 1976
Class 281			
25R	B 491,618	M	Mar. 16, 1976
Class 290			
17	B 477,597	E	Feb. 17, 1976
Class 292			
254	B 549,964	M	Feb. 24, 1976
Class 293			
71P	B 552,932	M	Feb. 3, 1976
Class 296			
35R	B 443,647	M	Feb. 17, 1976
	B 463,671	M	Jan. 13, 1976
137A	B 452,034	M	Mar. 23, 1976
Class 298			
35M	B 510,588	M	Jan. 27, 1976
Class 299			
31	B 499,209	M	Feb. 24, 1976
Class 303			
21BE	B 575,583	M	Mar. 16, 1976
Class 305			
27	B 506,566	M	Jan. 20, 1976
Class 307			
88.3	B 540,872	E	Jan. 20, 1976
137	B 466,444	E	Jan. 20, 1976
205	B 444,437	E	Mar. 9, 1976
	B 513,368	E	Feb. 3, 1976
232	B 540,078	E	Jan. 13, 1976
251	B 506,840	E	Mar. 23, 1976
	B 548,302	E	Feb. 17, 1976
252B	B 523,226	E	Mar. 23, 1976
255	B 492,688	E	Jan. 20, 1976
262	B 525,133	E	Mar. 23, 1976
270	B 497,960	E	Jan. 20, 1976
293	B 519,932	E	Feb. 3, 1976
296	B 512,849	E	Feb. 3, 1976
Class 308			
9	B 391,797	M	Mar. 9, 1976
36.3	B 562,413	M	Mar. 16, 1976
207R	B 507,661	M	Mar. 2, 1976
Class 310			
4R	B 539,746	E	Feb. 17, 1976
9.6	B 501,482	E	Jan. 13, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
41	B 561,784	E	Jan. 27, 1976
90	B 458,500	E	Feb. 24, 1976
155	B 592,143	C	Jan. 27, 1976
168	B 526,289	E	Feb. 24, 1976
254	B 521,045	E	Feb. 24, 1976
	B 521,046	E	Feb. 24, 1976
259	B 521,044	E	Feb. 24, 1976
Class 313			
42	B 534,443	E	Jan. 27, 1976
60	B 513,706	M	Jan. 13, 1976
94	B 517,762	E	Mar. 16, 1976
99	B 518,859	E	Feb. 3, 1976
273	B 531,929	E	Jan. 20, 1976
330	B 504,056	C	Feb. 24, 1976
	B 520,884	E	Mar. 16, 1976
366	B 515,455	E	Jan. 27, 1976
404	B 523,696	E	Jan. 13, 1976
452	B 160,045	E	Jan. 13, 1976
477	B 279,969	E	Jan. 13, 1976
Class 315			
169TV	B 463,322	E	Jan. 20, 1976
	B 520,613	E	Mar. 16, 1976
241P	B 501,503	E	Mar. 2, 1976
371	B 483,615	E	Jan. 27, 1976
379	B 422,156	E	Mar. 23, 1976
388	B 516,002	E	Jan. 13, 1976
399	B 467,971	E	Jan. 13, 1976
408	B 516,564	E	Feb. 17, 1976
Class 317			
9R	B 488,634	E	Jan. 20, 1976
18D	B 534,915	E	Mar. 23, 1976
36TD	B 504,404	E	Feb. 24, 1976
100	B 508,639	E	Mar. 23, 1976
101A	B 420,472	E	Feb. 24, 1976
120	B 527,187	E	Feb. 17, 1976
	B 531,566	M	Mar. 16, 1976
124	B 509,606	E	Feb. 3, 1976
259	B 506,461	E	Jan. 20, 1976
Class 318			
119	B 505,582	E	Mar. 23, 1976
139	B 475,236	E	Feb. 3, 1976
231	B 511,886	E	Feb. 3, 1976
257	B 502,973	E	Jan. 27, 1976
593	B 476,967	E	Mar. 9, 1976
Class 321			
2	B 533,734	E	Jan. 27, 1976
7	B 509,185	E	Feb. 3, 1976
61	B 495,759	E	Feb. 3, 1976
Class 322			
25	B 466,318	E	Mar. 9, 1976
Class 323			
1	B 430,276	E	Jan. 20, 1976
17	B 459,811	E	Jan. 20, 1976
	B 583,089	E	Jan. 27, 1976
22T	B 501,181	E	Feb. 10, 1976
Class 324			
13	B 79,099	E	Jan. 13, 1976
15	B 495,331	E	Mar. 16, 1976
51	B 534,767	E	Feb. 3, 1976
60C	B 540,218	E	Feb. 10, 1976
62	B 465,393	E	Jan. 27, 1976
83D	B 458,010	E	Mar. 16, 1976
158R	B 483,268	E	Mar. 9, 1976
Class 325			
40	B 558,220	E	Jan. 27, 1976
468	B 544,961	E	Jan. 13, 1976
Class 328			
129	B 78,315	E	Feb. 10, 1976
155	B 550,693	E	Jan. 20, 1976
167	B 532,326	E	Mar. 23, 1976
168	B 573,033	E	Mar. 23, 1976
Class 330			
15	B 530,813	E	Feb. 17, 1976
17	B 531,686	E	Mar. 23, 1976
33	B 439,542	E	Jan. 27, 1976
207P	B 553,460	E	Feb. 3, 1976
Class 331			
44ST	B 527,669	E	Jan. 13, 1976
51	B 538,686	E	Jan. 13, 1976
94.5C	B 549,931	E	Jan. 20, 1976
94.5G	B 442,295	E	Mar. 16, 1976
94.5L	B 506,916	E	Feb. 3, 1976
94.5M	B 384,654	E	Feb. 24, 1976
94.5P	B 394,350	E	Jan. 13, 1976
116R	B 527,693	E	Feb. 3, 1976
117R	B 571,219	E	Feb. 24, 1976
Class 332			
9R	B 507,087	E	Feb. 17, 1976
Class 333			
10	B 535,256	E	Mar. 23, 1976
30R	B 453,616	E	Jan. 27, 1976
31A	B 568,770	E	Feb. 10, 1976
72	B 534,991	E	Jan. 27, 1976
73W	B 339,194	E	Feb. 3, 1976
81A	B 493,370	E	Mar. 16, 1976
Class 335			
7	B 509,165	E	Mar. 2, 1976
186	B 526,654	E	Mar. 23, 1976
210	B 541,517	E	Jan. 13, 1976
253	B 515,452	E	Feb. 10, 1976
Class 336			
65	B 523,952	E	Mar. 23, 1976
Class 338			
166	B 489,526	E	Feb. 3, 1976
202	B 528,761	E	Feb. 10, 1976
Class 339			
5M	B 566,556	C	Mar. 23, 1976
Class 340			
8L	B 270,274	E	Feb. 17, 1976
146.1AB	B 428,408	E	Mar. 2, 1976
167B	B 568,226	E	Feb. 24, 1976
172.5	B 391,844	E	Mar. 16, 1976
	B 428,271	E	Mar. 23, 1976
	B 432,140	E	Mar. 23, 1976
	B 452,138	E	Mar. 23, 1976
	B 461,336	E	Feb. 3, 1976
	B 482,907	E	Jan. 20, 1976
	B 485,575	E	Feb. 24, 1976
	B 503,780	E	Mar. 16, 1976
	B 506,839	E	Mar. 23, 1976
	B 533,454	E	Mar. 2, 1976
173FF	B 495,185	E	Mar. 9, 1976
173LM	B 453,067	E	Mar. 23, 1976
173R	B 545,945	M	Jan. 27, 1976
174DC	B 443,712	E	Jan. 27, 1976
174TF	B 429,018	C	Feb. 10, 1976
	B 455,425	E	Feb. 3, 1976
	B 472,276	E	Mar. 9, 1976
	B 476,681	E	Jan. 13, 1976
	B 499,718	E	Jan. 27, 1976
198	B 546,665	E	Jan. 20, 1976
347AD	B 507,647	E	Jan. 27, 1976
	B 526,106	E	Jan. 27, 1976
347CC	B 498,500	E	Jan. 20, 1976
Class 343			
7A	B 248,240	E	Jan. 13, 1976
7.7	B 484,029	E	Feb. 10, 1976
8	B 497,702	E	Mar. 2, 1976
100LE	B 488,395	E	Jan. 27, 1976
	B 496,502	E	Jan. 20, 1976
786	B 547,994	E	Jan. 20, 1976
815	B 563,244	E	Jan. 27, 1976
840	B 494,691	E	Mar. 16, 1976
Class 346			
75	B 450,413	E	Mar. 23, 1976
	B 512,964	E	Feb. 10, 1976
139C	B 560,261	E	Mar. 16, 1976
Class 350			
7	B 469,036	M	Mar. 16, 1976
96WG	B 381,985	M	Feb. 3, 1976
	B 537,722	M	Feb. 3, 1976
103	B 586,663	M	Feb. 3, 1976
150	B 384,225	M	Mar. 16, 1976
160LC	B 527,054	M	Feb. 17, 1976
173	B 469,947	M	Jan. 20, 1976
310	B 520,543	M	Jan. 27, 1976
320	B 548,440	M	Feb. 3, 1976
Class 354			
23D	B 492,774	E	Mar. 9, 1976
46	B 515,135	E	Feb. 17, 1976
70	B 533,580	E	Feb. 3, 1976
156	B 507,131	E	Mar. 2, 1976
174	B 502,161	E	Mar. 2, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
288	B 559,111	E	Feb. 24, 1976
298	B 489,328	E	Jan. 20, 1976
Class 355			
8	B 509,474	M	Feb. 17, 1976
16	B 481,048	M	Mar. 16, 1976
17	B 493,501	M	Feb. 3, 1976
Class 356			
103	B 517,504	M	Mar. 9, 1976
110	B 492,093	M	Mar. 23, 1976
201	B 450,521	M	Feb. 17, 1976
239	B 530,569	M	Mar. 16, 1976
Class 357			
15	B 281,162	E	Mar. 23, 1976
16	B 496,487	E	Jan. 20, 1976
22	B 480,749	E	Mar. 9, 1976
	B 504,503	E	Mar. 9, 1976
23	B 516,060	E	Feb. 17, 1976
36	B 508,961	E	Feb. 3, 1976
52	B 520,115	E	Mar. 23, 1976
55	B 480,292	E	Mar. 16, 1976
59	B 535,209	E	Mar. 16, 1976
65	B 470,798	E	Jan. 20, 1976
72	B 481,930	E	Feb. 24, 1976
Class 358			
8	B 554,939	E	Feb. 10, 1976
28	B 73,017	E	Mar. 9, 1976
41	B 502,289	E	Jan. 13, 1976
Class 360			
1	B 484,365	E	Jan. 27, 1976
15	B 283,941	E	Feb. 3, 1976
17	B 461,874	E	Jan. 27, 1976
27	B 427,883	E	Jan. 20, 1976
35	B 347,661	E	Mar. 16, 1976
49	B 516,069	E	Mar. 16, 1976
60	B 453,432	E	Mar. 16, 1976
	B 491,111	E	Feb. 17, 1976
78	B 487,411	E	Feb. 24, 1976
80	B 403,477	E	Feb. 3, 1976
81	B 500,176	E	Feb. 3, 1976
85	B 501,253	E	Feb. 3, 1976
98	B 484,482	E	Mar. 23, 1976
102	B 458,964	E	Mar. 2, 1976
125	B 59,512	E	Mar. 16, 1976
130	B 579,806	E	Feb. 3, 1976
137	B 449,892	E	Mar. 23, 1976
Class 401			
219	B 557,621	M	Feb. 3, 1976
Class 403			
107	B 513,789	M	Feb. 3, 1976
318	B 540,632	M	Jan. 13, 1976
Class 404			
71	B 452,672	M	Jan. 13, 1976
77	B 434,206	M	Feb. 3, 1976
Class 408			
124	B 501,993	M	Jan. 13, 1976
146	B 521,986	M	Feb. 3, 1976
Class 415			
14	B 471,735	M	Feb. 3, 1976
115	B 561,712	C	Feb. 17, 1976
136	B 563,412	M	Feb. 24, 1976
213R	B 512,547	M	Jan. 13, 1976
214	B 552,006	M	Feb. 3, 1976
Class 416			
61	B 549,394	M	Jan. 27, 1976
145	B 567,158	M	Mar. 23, 1976
157B	B 513,346	M	Mar. 9, 1976
Class 417			
274	B 570,615	M	Mar. 23, 1976
Class 423			
15	B 372,722	C	Mar. 9, 1976
238	B 485,401	C	Jan. 27, 1976
242	B 66,272	C	Feb. 24, 1976
244	B 499,324	C	Mar. 16, 1976
249	B 402,553	C	Feb. 17, 1976
	B 428,386	C	Mar. 23, 1976
283	B 521,984	C	Feb. 17, 1976
315	B 471,221	C	Jan. 13, 1976
390	B 549,198	C	Jan. 13, 1976
393	B 491,455	C	Feb. 3, 1976
406	B 111,130	C	Mar. 16, 1976
448	B 414,028	C	Feb. 17, 1976
462	B 336,754	C	Mar. 16, 1976
471	B 521,612	C	Mar. 9, 1976
580	B 379,177	C	Jan. 27, 1976
Class 424			
9	B 426,424	C	Feb. 3, 1976
45	B 181,208	C	Mar. 9, 1976
62	B 464,593	C	Mar. 9, 1976
70	B 438,048	C	Mar. 23, 1976
115	B 482,660	C	Feb. 10, 1976
118	B 542,226	C	Feb. 24, 1976
122	B 482,058	C	Mar. 2, 1976
	B 524,179	C	Jan. 13, 1976
177	B 490,995	C	Feb. 3, 1976
203	B 576,903	C	Feb. 3, 1976
219	B 510,836	C	Mar. 23, 1976
230	B 487,133	C	Jan. 27, 1976
243	B 337,823	C	Mar. 23, 1976
245	B 493,955	C	Mar. 9, 1976
246	B 399,098	C	Feb. 24, 1976
251	B 450,870	C	Mar. 16, 1976
257	B 374,588	C	Jan. 27, 1976
258	B 426,639	C	Feb. 3, 1976
263	B 466,929	C	Jan. 27, 1976
267	B 307,698	C	Feb. 3, 1976
	B 407,737	C	Feb. 3, 1976
270	B 521,711	C	Feb. 10, 1976
273	B 459,408	C	Mar. 23, 1976
	B 566,464	C	Feb. 3, 1976
274	B 496,431	C	Jan. 13, 1976
	B 547,547	C	Feb. 24, 1976
281	B 587,786	C	Feb. 17, 1976
311	B 457,862	C	Jan. 27, 1976
317	B 510,850	C	Feb. 3, 1976
321	B 516,804	C	Mar. 23, 1976
362	B 495,489	C	Feb. 3, 1976
Class 425			
222	B 163,463	M	Jan. 27, 1976
237	B 431,334	M	Mar. 16, 1976
384	B 562,813	C	Feb. 3, 1976
521	B 411,765	M	Feb. 24, 1976
	B 548,688	M	Mar. 9, 1976
Class 426			
3	B 583,712	C	Feb. 10, 1976
73	B 493,950	C	Mar. 2, 1976
239	B 572,726	C	Feb. 24, 1976
276	B 535,944	C	Jan. 13, 1976
281	B 481,989	C	Mar. 23, 1976
	B 493,686	C	Mar. 23, 1976
535	B 560,717	C	Feb. 10, 1976
548	B 439,778	C	Feb. 3, 1976
561	B 389,605	C	Mar. 23, 1976
594	B 333,838	C	Mar. 23, 1976
656	B 478,759	C	Mar. 16, 1976
Class 427			
39	B 476,837	C	Jan. 20, 1976
54	B 421,608	C	Mar. 23, 1976
70	B 381,709	C	Jan. 13, 1976
93	B 371,635	C	Mar. 23, 1976
123	B 552,709	C	Mar. 23, 1976
145	B 457,547	C	Feb. 17, 1976
186	B 537,085	C	Feb. 17, 1976
207	B 501,415	C	Jan. 13, 1976
343	B 160,099	C	Jan. 13, 1976
372	B 409,848	C	Jan. 27, 1976
389	B 519,377	C	Jan. 27, 1976
Class 428			
73	B 481,737	C	Jan. 13, 1976
132	B 333,110	C	Mar. 16, 1976
175	B 468,330	M	Mar. 16, 1976
224	B 378,760	C	Mar. 9, 1976
289	B 402,929	C	Feb. 3, 1976
315	B 373,354	C	Jan. 27, 1976
341	B 450,196	C	Feb. 10, 1976
378	B 415,590	C	Mar. 23, 1976
428	B 554,655	C	Feb. 24, 1976
434	B 457,886	C	Jan. 13, 1976
447	B 456,069	C	Mar. 9, 1976
469	B 403,883	C	Mar. 23, 1976
515	B 474,747	C	Feb. 24, 1976
Class 431			
1	B 412,124	M	Mar. 23, 1976
175	B 534,313	M	Jan. 27, 1976
264	B 398,220	M	Feb. 3, 1976
Class 432			
49	B 536,511	M	Mar. 9, 1976

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF MARCH, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See*—
Tuomaala, Jorma Aarne Kullervo; and Myreen, Bertel, 3,945,615.

A. B. Dick Company: *See*—
Zaretsky, Joseph, 3,946,399.

A.W. Faber-Castell: *See*—
Edel, Guenter, 3,945,733.

Aaen, Olav, to Outboard Marine Corporation. Snowmobile track suspension with variable load transfer characteristics. 3,945,451, Cl. 180-9.520.

Aal, Robert A.; Chen, Norman H. C.; and Chapman, James K., Jr., to FMC Corporation. Distillation process for purification of triaryl phosphate esters. 3,945,891, Cl. 203-77.000.

AB Volvo Penta: *See*—
Backstrom, Karl Gustaf; and Borgersen, Kjell-Idar, 3,945,874.

Abe, Michio, to Tokai TRW & Co., Ltd. Ball joint. 3,945,739, Cl. 403-138.000.

Abele, Robert J.: *See*—
Allison, Kenneth C.; Francis, Howard T.; Abele, Robert J.; and Pawlak, Kenneth E., 3,945,384.

Ableitner, Erich, to Daimler-Benz Aktiengesellschaft. Suction pipe arrangement in reciprocating piston internal combustion engines. 3,945,357, Cl. 123-52.00M.

Abolins, Andrew; and Bertsch, Joseph A., to Strick Corporation. Structural assembly for mounting compressed air brake anti-skid equipment on vehicle. 3,945,687, Cl. 303-21.00R.

Abramitis, Walter W., to Akzona Incorporated. Plant growth regulatory agents and process. 3,946,074, Cl. 260-561.00K.

Acme-Cleveland Corporation: *See*—
van de Loo, Hansjuergen, 3,946,298.

Acquaro, Mario. Floor scrubber. 3,945,078, Cl. 15-99.000.

Adachi, Hayao: *See*—
Osuga, Masanori; and Adachi, Hayao, 3,945,895.

Adams, Corajean: *See*—
Adams, Warren H.; and Adams, Corajean, 3,945,369.

Adams, Sidney George William, to James Burn Bindings Limited. Machines for punching and for closing wire binding elements. 3,945,073, Cl. 11-1.00A.

Adams, Theodore P., to General Electric Company. Implantable cardiac pacer with characteristic controllable circuit and control device therefor. 3,945,387, Cl. 128-419.0PG.

Adams, Warren H.; and Adams, Corajean. Fireplace heat exchanger. 3,945,369, Cl. 126-164.000.

Addressograph-Multigraph Corporation: *See*—
Scholten, Frank L., 3,946,294.

Adelman, Stuart Lee. Apparatus for inspection and sampling in restricted aperture cavities employing fibre optics. 3,945,371, Cl. 128-2.00B.

Adolph, Horst G., to United States of America, Navy. Acetals derived from negatively substituted aldehydes and polynitro- or halonitroethanols. 3,946,085, Cl. 260-615.00A.

Ady, Esthmel W., to Baker & Ady, Inc. Food preparation and dispensing system. 3,945,534, Cl. 222-105.000.

AEG-Elotherm: *See*—
Reinke, Friedhelm; Stengel, Edgar; Emde, Friedhelm; and Schwarz, Hans Rudolf, 3,945,483.

AEG-Elotherm GmbH: *See*—
Scheffler, Friedrich, 3,945,513.

Aerospan Corporation: *See*—
Servais, Ronald A.; Bauer, Paul T.; and Meckstroth, Alan F., 3,945,677.

Agency of Industrial Science & Technology: *See*—
Kanetsuna, Hisaaki; and Kurita, Toshio, 3,946,094.
Saito, Kiyosi, 3,945,810.

Agfa-Gevaert AG: *See*—
Weber, Klaus; and Hell, August, 3,945,494.

Agfa-Gevaert Aktiengesellschaft: *See*—
Zorn, Hugo; Kuffner, Karl; Glockner, Hans; Willems, Jozef Frans; and Thiers, Robrecht Julius, 3,945,829.

Agfa-Gevaert N.V.: *See*—
Noe, Robert Joseph; and Rutten, Pierre Jean, 3,946,140.
Verhille, Karel Eugeen, 3,945,822.

Ahlgren, Nils Harald. Framework structures. 3,945,169, Cl. 52-741.000.

Airco, Inc.: *See*—
Kirk, Bradley S., 3,945,918.

Aizawa, Tsuneo, to Amada Company, Ltd. Material indexing feed mechanism for cutting machines. 3,945,282, Cl. 83-247.000.

Akino, Morio: *See*—
Yagi, Motoi; Akino, Morio; and Takeuchi, Hisaharu, 3,945,582.

Akulov, Evgeny Alexandrovich: *See*—
Borisov, Vasily Nikolaevich; Akulov, Evgeny Alexandrovich; and Solovei, Alexei Ivanovich, 3,945,312.

Akzona Incorporated: *See*—
Abramitis, Walter W., 3,946,074.

Alais, Michel, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Long-life thermoelectric generator. 3,945,854, Cl. 136-202.000.

Albany Engineered Systems: *See*—
Nicholson, Charles B., Jr., 3,945,925.

Albany International Industries, Inc.: *See*—
Fritz, Rene E.; and Foster, Ted C., 3,945,299.

Albrecht, William L.; and Fleming, Robert W., to Richardson-Merrell Inc. Bis-basic ketones of carbazole. 3,946,021, Cl. 260-293.610.

Alexander, Norman P.; and Gasparaitis, Bernard, to Motorola, Inc. Radio frequency connector system for portable radios. 3,946,390, Cl. 343-702.000.

Allen-Bradley Co.: *See*—
Hohberger, Clive P., 3,945,297.

Allen, Brian Robert; and Harrison, Anthony William, to Girling Limited. Method of manufacturing a friction disc. 3,946,192, Cl. 219-149.000.

Allen, Clifford H.: *See*—
Horvath, Louis T.; and Allen, Clifford H., 3,945,260.

Allen, Lindsay Alfred, to I.W.S. Nominee Company Ltd; and Commonwealth Scientific & Industrial Research Organization. Method of producing knop yarn. 3,945,189, Cl. 57-160.000.

Allera, Jean-Louis; Bergeri, Jacques; Perroud, Paul; Pleyber, Gaetan; and Violet, Jean-Louis, to Commissariat A l'Energie Atomique. Method and device for detecting the passage of objects. 3,946,224, Cl. 250-221.000.

Allgeier, Hans; and Gagneux, Andre, to Ciba-Geigy Corporation. Acetal derivatives of 6-phenyl-4H-s-triazolo[4,3-a][1,4]benzodiazepine-1-carboxaldehyde. 3,946,032, Cl. 260-308.00R.

Allied Chemical Corporation: *See*—
Figiel, Francis J.; Tepper, Robert J.; and Dunn, Michael L., 3,945,932.

Allis-Chalmers Corporation: *See*—
Dreisin, Alexander, 3,945,353.
Khatti, Ramkishan, 3,945,475.
O'Connor, John W., 3,945,208.
Rossi, Eugene F., 3,945,624.

Allison, Kenneth C.; Francis, Howard T.; Abele, Robert J.; and Pawlak, Kenneth E., to Biomedical International Company. Electrode, Cl. 128-2.06E.

Allocco, Andrew, Jr., to Lawrence Peska Associates, Inc., a part interest. Swimming pool water heating system. 3,945,059, Cl. 4-172.000.

Almeroth, Klaus: *See*—
Musall, Reimar; Wolsing, Wilhelm; and Almeroth, Klaus, 3,945,803.

Alper, Yekutiel: *See*—
Leavitt, Chaim; Alper, Yekutiel; and Gruenewald, Tzvi, 3,945,330.

Alpers, Gunther: *See*—
Heusler, Helmut; Alpers, Gunther; and Gerber, Jurgen, 3,945,138.

Alpha Metals, Inc.: *See*—
Manko, Howard H., 3,945,556.

Alpine Research, Inc.: *See*—
Ramer, Paul C., 3,945,134.

Alps Electric Co., Ltd.: *See*—
Ono, Ichiro, 3,946,437.

Altmann, Bert Lane; Gregg, Robert Milton; and Gioia, Norman Frank, to Victor Comptometer Corporation. Magnetic card transport. 3,946,438, Cl. 360-88.000.

Altmann, Dieter; and Haupt, Eberhard, to Wilhelm Haupt, Firma. Spacer strip, especially for electrical heating mats. 3,945,088, Cl. 24-81.0CC.

Aluminum Company of America: *See*—
Anderson, William A.; Rogers, Ralph W., Jr.; and Vernam, William D., 3,945,861.

Aluminum Pechiney: *See*—
Gaudilliere, Jean-Louis; and Dahan, Gilbert, 3,945,623.

Amada Company, Ltd.: *See*—
Aizawa, Tsuneo, 3,945,282.

American Chain & Cable Company, Inc.: *See*—
Cook, Virgil W.; Spates, Charles D.; Heil, Charles Wayne, deceased; Heil, Terry W., executor; and Diers, executrix by Kay A., 3,945,081.

American Construction Equipment Co., Inc.: *See*—
Weiss, Hubert Leger; and Dinkel, Ernest Josef, 3,946,282.

American Cyanamid Company: *See*—
Blank, Werner Josef, 3,945,961.
Villaume, Frederick George, 3,945,937.

American District Telegraph Company: *See*—
Galvin, Aaron A., 3,946,376.

American Hospital Supply Corporation: *See*—
Jones, Eugene C., 3,945,525.

American Microsystems, Inc.: *See*—
Wood, John R.; Morris, James B., Sr.; and Massoletti, Arnold M., 3,945,196.

American Optical Corporation: *See*—
Welter, Leonard M., 3,946,268.

Amey Roadstone Corporation Limited: *See*—
Farahar, Robert M., 3,945,782.

AMP Incorporated: *See*—
Sheesley, Wilmer Lee; and Pauza, William Vito, 3,945,808.

Amtsberg, Lester A., to Chicago Pneumatic Tool Company. Hydraulic rock drill with stroke responsive advance. 3,945,442, Cl. 173-10.000.

Anaconda Company, The: *See—*
Knudson, Gary L., 3,945,444.
Analog Devices, Incorporated: *See—*
Smith, Lewis R., 3,946,324.
Anazawa, Shinzo; Ueno, Seiichi; Nagasako, Isamu; Nawa, Tadashi; Irie, Toshiaki; and Sando, Shigeru, to Nippon Electric Company, Limited. Encapsulation package for a semiconductor element. 3,946,428, Cl. 357-74.000.
Anczurowski, Edward; and Julien, Brian E., to Domtar Limited. Disposable diaper. 3,945,386, Cl. 128-287.000.
Anderson, Clarence A.; and Taylor, Frank L., to Detroit Edison Company, The. Remote load control. 3,946,243, Cl. 307-140.000.
Anderson, John D. Percolation gauge. 3,945,247, Cl. 73-73.000.
Anderson, Kent V.; and Bilhorn, John M., to ESB Incorporated. Method of sealing a collation of battery layers together. 3,945,853, Cl. 136-175.000.
Anderson, Martin; and Kirkham, Peter H., to Shell Oil Company. Herbicidal 4-benzyloxymethyl oxazolines. 3,945,998, Cl. 260-240.00D.
Anderson, William A.; Rogers, Ralph W., Jr.; and Vernam, William D., to Aluminum Company of America. High strength automobile bumper alloy. 3,945,861, Cl. 148-12.700.
Andiano, Jose: *See—*
Delfosse, Gilbert; and Andiano, Jose, 3,945,178.
Ando, Seigo: *See—*
Mori, Toshiro; and Ando, Seigo, 3,946,307.
Ando, Shizuo, to Pioneer Electronic Corporation. Telephone answering device with plural message recording tapes. 3,946,160, Cl. 179-6.00R.
Andrews, Cecil L. Cable knot cincher. 3,945,092, Cl. 24-248.00L.
Anemostat Products Division Dynamics Corporation of America: *See—*
Lynch, John F.; and Waeldner, William J., 3,945,565.
Angliker, Hans-Jorg; Peter, Richard; and Liechti, Hans Wilhelm, to Ciba-Geigy AG. Fluoro triazine containing water insoluble azo dyestuff. 3,945,989, Cl. 260-153.000.
Annett, Charles E., II. Speed wrench. 3,945,274, Cl. 81-58.100.
Anstey, Nigel A., to Seiscom Delta Inc. Synthetic display of seismic reflection strength. 3,946,356, Cl. 340-15.5SS.
Anthony, Michael P.: *See—*
Schinella, Richard D.; and Anthony, Michael P., 3,945,857.
Aoki, Yoshio: *See—*
Saito, Tsunenari; and Aoki, Yoshio, 3,946,266.
Applewhite, Phillip: *See—*
Page, Wilbur Mills; and Applewhite, Phillip, 3,945,685.
Page, Wilbur Mills; and Applewhite, Phillip, 3,945,691.
Applied Bioscience: *See—*
Wertlake, Paul T.; and Harrison, James S., 3,945,523.
Aquila S.P.A.: *See—*
Bussi, Giancarlo; and Baradel, Pierpaolo, 3,945,931.
Arai, Haruhiko; Mino, Junryo; and Ide, Kimie, to Kao Soap Co., Ltd. Yellowing-preventive detergent composition. 3,945,951, Cl. 252-546.000.
Arakawa, Shinichiro, to Ebara Manufacturing Co., Ltd. Submerged pump. 3,945,771, Cl. 417-424.000.
Araoka, Toshinobu. Fan disturbing sand at the bottom of a body of water so that it may be pumped up efficiently. 3,945,761, Cl. 416-188.000.
Arbib, Richard H.: *See—*
Spier, I. Martin; and Arbib, Richard H., 3,945,599.
Argus Chemical Corporation: *See—*
Leveskis, Newton G., 3,945,940.
Armour and Company: *See—*
Blair, James M.; Sebring, Michael; Underwood, Warren H.; and Bley, William P., 3,946,117.
Armstrong Cork Company: *See—*
Bohrn, Walter J., 3,945,791.
Armstrong, Donald E., to GTE Sylvania Incorporated. Method of manufacturing a photoflash lamp having an indicator-insulator. 3,945,697, Cl. 316-17.000.
Arteche, Instrumentacion Y Sistemas Electronicos, S.A.: *See—*
Llona, Jesus Gomez; and Melendo, Sabino de Bernedo, 3,946,281.
Arvin Industries, Inc.: *See—*
McMillan, Robert H., 3,945,460.
Asaga, Ryuzi. Rotor engine. 3,945,359, Cl. 123-58.00R.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Nobusawa, Tsukumo, 3,945,732.
Asajima, Takenori: *See—*
Kobayashi, Haruo; Asajima, Takenori; and Narita, Yoshihiro, 3,945,979.
Asamoto, Hiroshi, to Kabushiki Kaisha Komatsu Seisakusho. Gripping device. 3,945,676, Cl. 294-88.000.
Asano, Yoshio; and Ohkubo, Kinji, to Fuji Photo Film Co., Ltd. Film cassette. 3,946,411, Cl. 354-174.000.
Ashikawa, Mikio: *See—*
Kamiyama, Takamitsu; and Ashikawa, Mikio, 3,946,151.
Ashworth, Monroe Alfred, III: *See—*
Weinstein, David Harold; Ashworth, Monroe Alfred, III; and Mallett, A. J., 3,946,357.
Asinger, Friedrich; Pfeifer, Wolf Dieter; Offermanns, Heribert; Scherberich, Paul; and Schreyer, Gerd, to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler. Process of making penicillamine. 3,946,069, Cl. 260-534.00S.
Asmussen, Daniel Richard; and Breen, Barry Cameron, to Tel-Tone Corporation. Port multiplexer for telephone signal processing systems. 3,946,163, Cl. 179-18.00J.
Assmann, Helmut: *See—*
Stehle, Heinz; Assmann, Helmut; Wahode, Peter; and Janson, Walter, 3,945,245.
Associated Electrical Industires Limited: *See—*
Bingham, Richard Albert, 3,946,227.
Atago, Takeshi; Hosho, Yukio; and Shimo, Shoji, to Hitachi, Ltd. Secondary air control device. 3,945,205, Cl. 60-289.000.
Ateliers J. Hanrez S.A.: *See—*
Enody, Emil; Kovacs, Sandor; Gelanyi, Istvan; Karoly, Bela; and Kacsmarek, Bela, 3,945,072.
Athletic Swing Measurement, Inc.: *See—*
Hammond, James L., 3,945,646.
Atkinson, Robert E.: *See—*
Hughes, Richard Smith; and Atkinson, Robert E., 3,946,383.
Atlantic Richfield Company: *See—*
Fuger, Karl E.; and Burk, Emmett H., Jr., 3,946,014.
Yoo, Jin Sun; and Voss, Andrew P., 3,945,914.
Atlas Copco Aktiebolag: *See—*
Eriksson, Sven Erik Nore, 3,945,519.
Atos Oleodinamica S.p.A.: *See—*
Tirelli, Paolo, 3,945,399.
Augustine, Lawrence G., to Motorola, Inc. Opto-coupler. 3,946,423, Cl. 357-30.000.
Austin, James R.: *See—*
Kossiakoff, Alexander; and Austin, James R., 3,946,382.
Automobiles Peugeot: *See—*
Calviac, Jean-Pierre, 3,945,355.
Avia Instrument Company: *See—*
Hauser, Frank William, 3,945,070.
Ayres, Waldemar A., to Becton, Dickinson and Company. Serum/-plasma separators with centrifugal valves. 3,945,928, Cl. 210-516.000.
B. C. Ames Company: *See—*
Milette, Roger C., 3,945,339.
B. F. Goodrich Company, The: *See—*
Pottinger, Marion G., 3,945,422.
Babson, Edward S.; and Gorini, Robert F., to USM Corporation. Machine for stiffening workpieces such as shoe components. 3,945,074, Cl. 12-52.000.
Bach, Lloyd G.: *See—*
Buente, Stephen M.; and Bach, Lloyd G., 3,945,301.
Backstrom, Karl Gustaf; and Borgersen, Kjell-Idar, to AB Volvo Penta. Method of assembling hubs, particularly propeller hubs for boat engines. 3,945,874, Cl. 156-294.000.
Bacro, Bruno, to Societe Nouvelle de la Teinturerie de la Chaussee Romaine. Method and apparatus for forming a yarn web on a conveyor. 3,945,545, Cl. 226-97.000.
Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Schefczik, Ernst; and Kast, Hellmut, 3,946,017.
Baez Rios, Guillermo, to Rodriguez, Emilio Retana. Saw tooth. 3,945,289, Cl. 83-853.000.
Bahnsen, Gerhard I. W. Detachable connections for cameras or the like. 3,945,738, Cl. 403-109.000.
Baker & Ady, Inc.: *See—*
Ady, Esthmel W., 3,945,534.
Baker, John D.; and Carus, Bryce W., to Stewart-Warner Corporation. Air core gauge with expanded pointer range. 3,946,311, Cl. 324-167.000.
Bakker, Lynn A.: *See—*
Mao, Chung-Ling; and Bakker, Lynn A., 3,946,038.
Balandis, Leo Steven, to Xerox Corporation. Zig-zag folded strip bottom feeder. 3,945,546, Cl. 226-118.000.
Balcke-Durr Aktiengesellschaft: *See—*
Mayr, Gunter; and Schlaich, Jorg, 3,945,106.
Ballard, Donnell A.: *See—*
Borchert, Alfred E.; Capaldi, Eugene C.; and Ballard, Donnell A., 3,945,941.
Balve, Robert. Two-chamber, two-stroke rocking piston internal combustion engine. 3,945,348, Cl. 123-18.00R.
Ban, Itsuki. Electronic flash system. 3,946,269, Cl. 315-151.000.
Banfi, Dezso: *See—*
Mlinko, Sandor; Banfi, Dezso; Gacs, Istvan; Payer, Karoly; Otvos, Laszlo; Vargay, Zoltan; Dobis nee Farkas, Emilia; and Palagyi, Tivadar, 3,945,797.
Banko, Anton, to Surgical Design Corporation. Rotatable surgical instrument. 3,945,375, Cl. 128-6.000.
Banks, Michael H.; and Granillo, Gilbert R., Jr. Brake for skateboard and the like. 3,945,655, Cl. 280-11.200.
Bantner, John A. Graphic symbol generator. 3,946,365, Cl. 340-172.500.
Baradel, Pierpaolo: *See—*
Bussi, Giancarlo; and Baradel, Pierpaolo, 3,945,931.
Barber, William D.: *See—*
Sigsbee, Raymond A.; and Barber, William D., 3,946,418.
Barger, John L.: *See—*
Bronikowski, Raymond J.; Marek, James R.; and Barger, John L., 3,946,351.
Barkstrom, Reynold; Rickerd, Calvin P.; and Swanson, William C., to International Harvester Company. Variable speed feed roll drive mechanism for forage harvesters. 3,945,175, Cl. 56-10.800.
Barlow, Terence William, to Barlow's Coated Fabrics Limited. Protective gloves. 3,945,049, Cl. 2-169.000.
Barlow's Coated Fabrics Limited: *See—*
Barlow, Terence William, 3,945,049.
Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
Schippers, Heinz; and Lenk, Erich, 3,945,579.

Schippers, Heinz; and Lenk, Erich, 3,945,581.
Barnes, Carl K.: *See—*
Barnes, John O.; and Barnes, Carl K., 3,945,154.
Barnes, John O.; and Barnes, Carl K., to Jack Barnes Engineering, Inc. Grinding apparatus and indexing and control means therefor. 3,945,154, Cl. 51-137.000.
Barnes, Thomas W., to Richmond Manufacturing Company, The. Steerable rock boring head for earth boring machines. 3,945,443, Cl. 175-73.000.
Barnstedt, Egge: *See—*
Berg, Gerhard; Nordsiek, Karl-Heinz; and Barnstedt, Egge, 3,945,978.
Barny, Jean-Jacques, to S.A. Martin. Cardboard blank folding machine. 3,945,305, Cl. 93-49.00R.
Barr and Stroud Limited: *See—*
Houston, John Kenneth; and Winter, Andrew Simpson, 3,946,155.
Barrel Fresh Service AG.: *See—*
Haag, Walter, 3,945,529.
Barrett, DeLoris Joan: *See—*
Peters, Jack; and Barrett, DeLoris Joan, 3,945,472.
Barron, Benny Gene, to Dow Chemical Company, The. Mixtures of high and low molecular weight polyols resistant to phase separation. 3,945,939, Cl. 252-182.000.
Barry, Charles B., to Ralph M. Parsons Co., The. In situ recovery of hydrocarbons from tar sands. 3,945,435, Cl. 166-267.000.
Bartera, Ralph E.: *See—*
United States of America, National Aeronautics and Space Administration; Miller, Charles G.; and Bartera, Ralph E., 3,945,801.
Barth, Erich: *See—*
Forster, Friedrich; Barth, Erich; and Keller, Heinz-Jochen, 3,946,104.
Barton, Paul: *See—*
Overbury, Francis G.; Barton, Paul; and Kelly, Kevin M., 3,946,320.
Overbury, Francis G.; and Barton, Paul, 3,946,386.
BASF Aktiengesellschaft: *See—*
Fischer, Adolf; and Rohr, Wolfgang, 3,946,048.
Gantert, Manfred, 3,946,431.
Horn, Peter; and Kuerten, Heribert, 3,945,969.
Rokohl, Rudolf; Fikentscher, Rolf; and Helfert, Herbert, 3,945,794.
BASF Wyandotte Corporation: *See—*
Gokhale, Sudarshan D., 3,945,907.
Bashark, Larry T., to Whirlpool Corporation. Refrigeration system defrost control. 3,945,217, Cl. 62-151.000.
Bateman, Charles Donald, to Sundstrand Data Control, Inc. Aircraft ground proximity warning instrument. 3,946,358, Cl. 340-27.00R.
Batorewicz, Wadim, to Uniroyal, Inc. Flame retardant polyurethanes from polymeric halogenated organo phosphorous diols. 3,945,954, Cl. 260-2.5AR.
Bauer, Paul T.: *See—*
Servais, Ronald A.; Bauer, Paul T.; and Meckstroth, Alan F., 3,945,677.
Bayer Aktiengesellschaft: *See—*
Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 3,946,027.
Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 3,946,028.
Hund, Franz, 3,946,103.
Margotte, Dieter; and Vernaleken, Hugo, 3,946,090.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,946,026.
Sommer, Richard; and Wolfrum, Gerhard, 3,945,992.
Thiel, Reinhard; Rosenbaum, Heinz Jorg; and Heller, Karl Heinz, 3,946,077.
Wedemeyer, Karl-Friedrich; and Imre, Laszlo, 3,946,081.
Bayliss, Raymond Terence: *See—*
Burgess, Brian; Bayliss, Raymond Terence; Stokes, Peter Bryan; and Eynon, George Thomas, 3,945,573.
BBC Aktiengesellschaft Brown, Boveri & Cie.: *See—*
Schleich, Armin, 3,946,348.
Beard, Colin C., to Syntex Inc. 2-Substituted-1,2,4-thiadiazolo-[2,3-a]-benzimidazoles. 3,946,031, Cl. 260-306.80F.
Beasley, Glenn H.; and Cartier, Peter G., to Rohm and Haas Company. Process for removing sulfur compounds from gases. 3,945,811, Cl. 55-73.000.
Beaty, Thomas, Jr.; and Fournier, Daniel. Automatic grate changing system and methods of utilizing and constructing same. 3,945,105, Cl. 29-401.00F.
Beaver, John R., to Rudolph Beaver, Inc. Surgical blade with adjustable blade guard. 3,945,117, Cl. 30-287.000.
Bechtel, Jon Harold, to Johnson Service Company. Insertion integrating controller. 3,946,297, Cl. 318-609.000.
Becking, Donald Harvey: *See—*
Martin, Sylvia; Creutz, Hans Gerhard; and Becking, Donald Harvey, 3,945,894.
Beckmann, Oskar: *See—*
Habock, Adolf; Beckmann, Oskar; Frese, Stefan; Radda, Herbert; Mayerhofer, Franz; and Leowald, Karl-Friedrich, 3,946,389.
Beckner, Wilbur Ripple, to Carborundum Company, The. Runnerhead for a throwing wheel. 3,945,150, Cl. 51-9.00R.
Becton, Dickinson and Company: *See—*
Ayres, Waldemar A., 3,945,928.
Rebold, Jerome I., 3,945,254.
Beeck, Carlos Luis, to Tektronix, Inc. Optoelectronic switch. 3,946,225, Cl. 250-237.00G.
Beeman, Robert H., to GTE Automatic Electric Laboratories Incorporated. Precise tone signal generator. 3,946,164, Cl. 179-84.0VF.
Beery, Jack; and Wisner, Daniel A., to Burroughs Corporation. Solenoid control system with cusp detector. 3,946,285, Cl. 317-123.000.
Behn, Rudolf: *See—*
Hoppe, Lutz; and Behn, Rudolf, 3,945,983.
Bell, Charles Gilbert; and Randolph, Michael M. Fluid actuated gear changing system. 3,945,265, Cl. 74-335.000.
Bell, Robert L. Book holder. 3,945,598, Cl. 248-441.00D.
Bell Telephone Laboratories, Incorporated: *See—*
De Loach, Bernard Collins, Jr.; and DiDomenico, Mauro, Jr., 3,946,335.
Schmidt, Ronald Vernon, 3,946,338.
Schonhorn, Harold; Sessler, Gerhard Martin; and West, James Edward, 3,945,112.
Beloit Corporation: *See—*
Sokolow, Nickolas N., 3,945,622.
Belshaw Brothers, Inc.: *See—*
Belshaw, Thomas E.; Woodworth, Fred G.; and Wilke, Wilbur D., 3,945,785.
Belshaw, Thomas E.; Woodworth, Fred G.; and Wilke, Wilbur D., to Belshaw Brothers, Inc. Apparatus for filling edible products. 3,945,785, Cl. 425-132.000.
Bendix Corporation, The: *See—*
Buente, Stephen M.; and Bach, Lloyd G., 3,945,301.
Carrico, John Paul, 3,946,177.
Moseman, Paul W., Jr.; Passeri, David; and Carrico, John P., 3,946,229.
Philips, William D.; and Franklin, William H., Jr., 3,946,337.
Bennett, Gene Lee, to Genio Tools, Inc. Cutting tool holder. 3,945,752, Cl. 408-146.000.
Bennett, Russell B.; Millicovsky, William; and Pritz, Howard B., to SmithKline Corporation. Unit dose ampul for jet injector. 3,945,383, Cl. 128-272.000.
Berg, Gerhard; Nordsiek, Karl-Heinz; and Barnstedt, Egge, to Chemische Werke Huels Aktiengesellschaft. Process for the production of pourable, pulverulent filler mixtures containing plasticizer oils. 3,945,978, Cl. 260-33.6AQ.
Bergeri, Jacques: *See—*
Allera, Jean-Louis; Bergeri, Jacques; Perroud, Paul; Pleyber, Gaetan; ard Violet, Jean-Louis, 3,946,224.
Berges, David Alan, to SmithKline Corporation. 7-Amino-3-(1,2,4-triazolinylthiomethyl)cephalosporins. 3,946,005, Cl. 260-243.00C.
Bergkvist, Lars A. Instrument for the indication or checking of the angular position of an object. 3,945,129, Cl. 33-399.000.
Bergwerksverband GmbH: *See—*
Busbach, Willi, 3,945,515.
Berkowitz, Ami E., to General Electric Company. Magnetic brush for use in magnetic printing. 3,945,343, Cl. 118-623.000.
Berkowitz, Ami E.; and Lahut, Joseph A., to General Electric Company. Direct current bias fields for magnetic printing. 3,946,404, Cl 346-74.100.
Berrange, Aubrey R., to Compaction Technology (Proprietary) Limited. Compaction by superimposing impact forces on a preloaded area of soil. 3,945,748, Cl. 404-117.000.
Berry, James M.; Hauser, Anthony J.; and Swanson, Carl D., to Teletype Corporation. Ink jet mask. 3,946,405, Cl. 346-140.00R.
Bertolino, Charles, to Etat Francais. Multiplexing device for panoramic sonar systems. 3,946,355, Cl. 340-6.00R.
Bertsch, Joseph A.: *See—*
Abolins, Andrew; and Bertsch, Joseph A., 3,945,687.
Besser, Paul J.: *See—*
Henry, Rodney D.; Besser, Paul J.; and Warren, Robert G., 3,946,372.
Mee, Jack E.; Heinz, David M.; Hamilton, Thomas N.; Besser, Paul J.; and Pulliam, George R., 3,946,124.
Besso, Michael M.: *See—*
Davis, Herbert L.; Jaffee, Michael L.; and Besso, Michael M., 3,946,100.
Bethlehem Steel Corporation: *See—*
Townsend, Herbert E., Jr.; and Horton, James B., 3,945,795.
Bhopale, Arvind M.: *See—*
Stuart, Richard L.; and Bhopale, Arvind M., 3,946,214.
Bianca, Dominick, to Du Pont de Nemours, E. I., and Company. Bonding with polyisocyanates. 3,945,876, Cl. 156-331.000.
Biefeld, Lawrence P.; Foley, Kevin M.; and McCombs, Frank Paul, to Owens-Corning Fiberglas Corporation. Glass fibers coated with silicon containing aminimide compounds. 3,946,131, Cl. 428-378.000.
Bierbaum, Charles A.: *See—*
Elazar, Shmuel; and Bierbaum, Charles A., 3,945,250.
Biermann, Rudolf, to Siemens Aktiengesellschaft. Method and apparatus for determining gas content in inorganic substances. 3,946,228, Cl. 250-282.000.
Bilhorn, John M.: *See—*
Anderson, Kent V.; and Bilhorn, John M., 3,945,853.
Billet, Lucien; and Lartigau, Guy, to Rhone-Poulenc Textile. Process for the preparation of saturated long-chain dicarboxylic acids. 3,946,070, Cl. 260-537.00P.
Billi, Giorgio, to Billi, S.p.A. Control system for circular knitting machines and the like. 3,945,224, Cl. 66-56.000.
Billi, S.p.A.: *See—*
Billi, Giorgio, 3,945,224.
Bingham, Richard Albert, to Associated Electrical Industires Limited. Mass spectrographs and ion collector systems therefor. 3,946,227, Cl. 250-281.000.
Biomedical International Company: *See—*
Allison, Kenneth C.; Francis, Howard T.; Abele, Robert J.; and Pawlak, Kenneth E., 3,945,384.
Birks, Harry Davies: *See—*
Walker, Andrew; Long, Charles Frederick; and Birks, Harry Davies, 3,945,426.

Bisgaard, Hans Flinker; and Klemar, Benny Aaris, to H. Maihak AG. Method of and apparatus for monitoring a process involving a plurality of parameters. 3,945,255, Cl. 73-432.00R.

Bishop, Marion M.; and Weist, Walter Robert, to Boeing Company, The. Redundant DC power supply for analog computers and the like. 3,946,375, Cl. 340-253.00C.

Bishop, Thomas G., to Koehring Company. Injection molding apparatus for producing articles with a mottled appearance. 3,945,786, Cl. 425-208.000.

Bjerede, Bjorn E., to General Dynamics Corporation. Digital circuit for generating output pulses synchronized in time to zero crossings of incoming waveforms. 3,946,323, Cl. 328-63.000.

Black Clawson Fibreclaim Inc.: *See—*
Marsh, Paul G., 3,945,575.

Black, Jerimiah B. Spring power cell for vehicular spring motor. 3,945,453, Cl. 180-54.00R.

Blair, James M.; Sebring, Michael; Underwood, Warren H.; and Bley, William P., to Armour and Company. Poultry carcass treating process. 3,946,117, Cl. 426-281.000.

Blank, Werner Josef, to American Cyanamid Company. Novel cross-linking agents and their use in electrophoretic coating composition. 3,945,961, Cl. 260-29.4UA.

Bley, William P.: *See—*
Blair, James M.; Sebring, Michael; Underwood, Warren H.; and Bley, William P., 3,946,117.

Bleyle, Merrill; DelVecchio, William D.; and Trofimow, Alex, to W. R. Grace & Co. Vinylidene chloride copolymer latexes. 3,946,139, Cl. 428-518.000.

Bloch, Peter, to Maag Gear-Wheel & Machine Company Limited. Gear tester. 3,945,126, Cl. 33-179.50R.

Bobo, Melvin, to General Electric Company. Bleed air manifold. 3,945,759, Cl. 415-145.000.

Bochory, Michael E. Fastener assembly. 3,945,669, Cl. 285-92.000.

Bockenstette, Joseph A., II. Rotating atomizer nozzle. 3,945,572, Cl. 239-171.000.

Boctor, Stalin A., to Northern Electric Company, Limited. Functionally tunable active filter. 3,946,328, Cl. 330-107.000.

Bodenseewerk Geratetechnik GmbH: *See—*
Schanzer, Gunther W., 3,945,593.

Boehme, Dietrich; Hahn, Gunter; Schumann, Gunter; Wienen, Walter; and Jung, Rolf, to Messer Griesheim GmbH; and Krauss und Reichert. Process and apparatus for automatically cutting out work pieces in accordance with a pattern. 3,945,279, Cl. 83-34.000.

Boeing Company, The: *See—*
Bishop, Marion M.; and Weist, Walter Robert, 3,946,375.
Drucker, Elliott H., 3,946,387.
May, Jack L., 3,946,215.

Boeke, Uwe; Hennemann, Lothar Roland; Hohorst, Wolfgang; and Urban, Horst, to Norddeutsche Seekabelwerke AG. Water-tight connectors for electric cables. 3,945,701, Cl. 339-60.00R.

Bogachev, Viktor Vladimirovich: *See—*
Yascheritsyn, Petr Ivanovich; Golant, Jury Khonanovich; Leushkin, Vadim Nikolaevich; Mironov, Gennady Mikhailovich; Minakov, Anatoly Petrovich; and Bogachev, Viktor Vladimirovich, 3,945,098.

Bogdanova, Lidia Ivanovna: *See—*
Listov, Petr Nikolaevich; Ganiev, Madzhid Saidovich; Buromsky, Vladimir Ivanovich; Bogdanova, Lidia Ivanovna; Kalafatov, Enver Tefikovich; Topalidi, Dmitry Nikolaevich; Rodionov, Vitaly Petrovich; Junusov, Edem Idrisovich; and Fedorov, Valery Pavlovich, 3,945,179.

Bohash, James J. Visored cap. 3,945,050, Cl. 2-197.000.

Bohme, August Edward. Fire extinguishing apparatus for oxy-acetylene welding assemblies. 3,945,440, Cl. 169-54.000.

Bohrn, Walter J., to Armstrong Cork Company. In-register printed and embossed carpet. 3,945,791, Cl. 8-17.000.

Boman, Karl Gunnar, to Sandco Limited. Dual-belt press. 3,945,789, Cl. 425-371.000.

Bomor Equipment, Inc.: *See—*
Moran, Vernon J., 3,945,309.

Bonnel, Michele, to Thomson-CSF. Method for manufacturing a connecting circuit for an integrated miniaturised wiring system. 3,945,113, Cl. 29-625.000.

Bonneville, Jacques: *See—*
Kellow, Mazin; VanSant, James; and Bonneville, Jacques, 3,946,142.

Booth, Sterling R., Jr.; and Rhoads, Kenneth A., to Caterpillar Tractor Co. Track roller. 3,945,693, Cl. 308-20.000.

Borchert, Alfred E.; Capaldi, Eugene C.; and Ballard, Donnell A., to Oxirane Corporation. Hazard reduction for bulk shipment quantities of aqueous tertiary butyl hydroperoxide. 3,945,941, Cl. 252-186.000.

Borgersen, Kjell-Idar: *See—*
Backstrom, Karl Gustaf; and Borgersen, Kjell-Idar, 3,945,874.

Borgstrom, Lennart Carl Gote, to Record Taxameter AB. Service meter with pulse counter. 3,946,208, Cl. 235-92.0EA.

Borisenkov, Oleg Nikolaevich: *See—*
Ulyanov, Lev Petrovich; Borisenkov, Oleg Nikolaevich; Kastorskaya, Natalya Nikolaevna; Vinogradov, Georgy Vladimirovich; Yanovsky, Jury Grigorievich; and Sergeenkov, Sergei Ivanovich, 3,945,242.

Borisov, Vasily Nikolaevich; Akulov, Evgeny Alexandrovich; and Solovei, Alexei Ivanovich. Apparatus for separating seed cover from endosperm of grain of various cereal crops. 3,945,312, Cl. 99-605.000.

Borys, Zdzislaw. Prefabricated wall elements. 3,945,157, Cl. 52-36.000.

Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, to Bayer Aktiengesellschaft. 3,5,6-Tricarboxy-4-pyridyl-1,4-dihydropyridine derivatives. 3,946,027, Cl. 260-295.50R.

Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, to Bayer Aktiengesellschaft. 2,3,5,6-Tetracarboxy-4-pyridyl-1,4-dihydropyridine derivatives. 3,946,028, Cl. 260-295.50R.

Bossert, Friedrich: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,946,026.

Bost, Howard W., to Phillips Petroleum Company. 2-Mercaptoarylthioazole production. 3,946,030, Cl. 260-306.000.

Boston Insulated Wire & Cable Co.: *See—*
Didier, Robert G., 3,945,700.

Boswell, George T., to United States of America, Army. Impact and self-destruct fuze. 3,945,323, Cl. 102-71.000.

Boswinkel, Paul. Chair with independently pivotable seat cushion and back frame. 3,945,651, Cl. 297-337.000.

Boucher, Claude. Window construction. 3,945,149, Cl. 49-121.000.

Boulenger, Paul, to L Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude. Purification of effluent. 3,945,916, Cl. 210-7.000.

Bourges, Bernard M., to Societe Anonyme: Poclain. Telescopic jack. 3,945,300, Cl. 91-173.000.

Bourke, Robert F.: *See—*
Christianson, Clinton C.; and Bourke, Robert F., 3,946,299.

Bowell, Stephen T.: *See—*
Ramig, Alexander, Jr.; and Bowell, Stephen T., 3,945,965.

Bozich, Robert A., to Malton Electric Company. Enclosure for electrical use. 3,945,530, Cl. 220-329.000.

Bozzi, Edward G., Jr.: *See—*
Smith, Harry A.; and Bozzi, Edward G., Jr., 3,945,973.

Braden, Anna P., executrix: *See—*
Rudder, Walter H.; Braden, William D., deceased; McEvoy, Charles J.; Dodson, Stokes R., Jr.; Thiele, John R.; and Livgren, Allen L., 3,945,866.

Braden, William D., deceased: *See—*
Rudder, Walter H.; Braden, William D., deceased; McEvoy, Charles J.; Dodson, Stokes R., Jr.; Thiele, John R.; and Livgren, Allen L., 3,945,866.

Bradley, Floyd P.; and Smith, Lawrence S., to United Technologies Corporation. Flyweight speed sensor. 3,945,199, Cl. 60-39.28R.

Branson Ultrasonics Corporation: *See—*
Quist, Eric G., 3,946,280.
Shoh, Andrew, 3,945,618.

Brasa, Umberto. Web registration system using retrograde web movement. 3,945,317, Cl. 101-124.000.

Braschler, Steve A.: *See—*
Prather, George A.; and Braschler, Steve A., 3,945,473.

Brattle Instrument Corporation: *See—*
Tweed, David G.; and LaWhite, Eric, 3,945,373.

Braun, Robert E.; Jones, Richard H.; Sprenkle, George J.; and Stopper, Herbert, to Burroughs Corporation. Island assembly employing cooling means for high density integrated circuit packaging. 3,946,276, Cl. 317-100.000.

Brautigam, Jurgen: *See—*
Simonsen, Harald; and Brautigam, Jurgen, 3,945,263.

Bredbenner, Lee P., to Maryland Grading and Fabricating Company, Inc. Grating structure for roadway storm drain inlets and the like. 3,945,746, Cl. 404-4.000.

Breen, Barry Cameron: *See—*
Asmussen, Daniel Richard; and Breen, Barry Cameron, 3,946,163.

Breglia, Denis R.: *See—*
Mohon, Windell N.; Derderian, George; and Breglia, Denis R., 3,945,133.

Bremer, Robert C., Jr., to Wallace Murray Corporation. Torsional vibration damper with interleaf. 3,945,269, Cl. 74-574.000.

Brennan, James A.; and Morrison, Roger A., to Mobil Oil Corporation. Manufacture of lower aromatic compounds. 3,945,913, Cl. 208-137.000.

Breslow, Jeffrey D., to Marvin Glass & Associates. Board game apparatus. 3,945,643, Cl. 273-134.00B.

Breuer, Hermann: *See—*
Treuner, Uwe D.; and Breuer, Hermann, 3,946,001.

Brever, Leslie H.; and Steinke, Frederick H., to Ralston Purina Company. High performance horse feed and method of making. 3,946,115, Cl. 426-72.000.

Brignoli, Silvio. High speed hammer forging machines. 3,945,237, Cl. 72-402.000.

Bristol-Myers Company: *See—*
Naito, Takayuki; Okumura, Jun; and Kamachi, Hajime, 3,946,000.

British Leyland UK Limited: *See—*
Drury, Cyril John, 3,945,161.

British Mathews Limited, The: *See—*
Harman, Frederick George, 3,945,520.

British Nuclear Fuels Limited: *See—*
Cocker, Peter; and Price, Michael Anthony, 3,945,885.

British Steel Corporation: *See—*
Oxlade, Roy Ronald; and Westgarth, David James, 3,945,235.

Brobeck, William M.; Givins, John S., Jr.; Meads, Philip F., Jr.; and Thomas, Robert E., to Transactron, Inc. Point-of-sale system and apparatus. 3,946,220, Cl. 235-168.000.

Brockett, Frank Howard, III: *See—*
Sullivan, Arthur Francis; Brockett, Frank Howard, III; and Harthan, Lewis John, III, 3,945,394.

Brockmuller, Friedrich Franz, to Windmoller & Holscher. Cross-bottom bag and method of making same. 3,945,562, Cl. 229-62.500.

Bronikowski, Raymond J.; Marek, James R.; and Barger, John L., to McGraw-Edison Company. Shielded fuse assembly. 3,946,351, Cl. 337-224.000.

Brookover, William S., Jr. Diesel engine cylinder liner puller tool. 3,945,104, Cl. 29-255.000.

Brooks, Fred A. Self regulating telephone sets. 3,946,170, Cl. 179-170.00R.

Brossi, Arnold; Kloetzer, Wilhelm; and Teitel, Sidney, to Hoffmann-La Roche Inc. 6-(3,4-Methylenedioxy-6-benzylalkylaminoethylphenylacetyl)benzoic acid alkyl ester derivatives. 3,946,041, Cl. 260-340.500.

Brotzmann, Karl; and Fassbinder, Hans Georg, to Eisenwerk-Gesellschaft Maximilianshutte mbH. Process and immersion lances for introducing oxygen into a metal melt. 3,945,820, Cl. 75-60.000.

Brower, Stephen M.: *See*—
Deaton, David W.; Brower, Stephen M.; and Durham Jr., Marshall P., 3,945,392.

Brown, Barry David. Methods of making printed circuit boards utilizing an image transparency mode with Herschel-effect film. 3,945,827, Cl. 96-36.200.

Brown, Bruce T., to United Technologies Corporation. Diffusion bonding separator. 3,945,240, Cl. 72-462.000.

Brown, David James, to Conder International Limited. Integrated ceiling light and air-circulation arrangement. 3,945,306, Cl. 98-40.0DL.

Brown, Joseph Martin, to Chance Manufacturing Company, Inc. Convertible trailer vehicle and amusement ride. 3,945,659, Cl. 280-34.00R.

Brown, Paul L. Gyroscopic top. 3,945,146, Cl. 46-50.000.

Brown, Richard E.; and Shavel, John, Jr., to Warner-Lambert Company. Substituted benzopyrano[3,4-c]pyridines. 3,946,008, Cl. 260-247.20B.

Brown, Rodney F. Extension of shelf life of fresh produce. 3,945,170, Cl. 53-21.00R.

Brown, Stanley R., to United States of America, Navy. Fretting corrosion test fixture. 3,945,241, Cl. 73-7.000.

Brown, Wallace G.; and Lloyd, Thomas C., to GTE Automatic Electric Laboratories Incorporated. Discrete ringing detector for use in key telephone systems. 3,946,146, Cl. 179-99.000.

Brownson, De Witt M. Storage hook for razor and blades. 3,945,499, Cl. 211-88.000.

Brunemann, James C. Assembly support for pre-fabricating building panels. 3,945,630, Cl. 269-321.00F.

Brunswick Corporation: *See*—
Entringer, David C., 3,945,201.

Brush, Charles K.: *See*—
Kwiatek, Jack; Murib, Jawad H.; and Brush, Charles K., 3,946,067.

Bruynes, Cornelis Adrianus; and van der Drift, Johannes Karel, to Gist-Brocades N.V. Novel acid compounds. 3,945,994, Cl. 260-239.100.

Buckman Laboratories, Inc.: *See*—
Buckman, Stanley J.; Lang, Rudolf F.; and Mishler, Michael L., 3,946,061.

Buckman, Stanley J.; Lang, Rudolf F.; and Mishler, Michael L., to Buckman Laboratories, Inc. Organo-silica polymers. 3,946,061, Cl. 260-448.80R.

Budrose, Charles R. Adapter for recording-reproducing machine. 3,946,156, Cl. 179-1.0AT.

Buente, Stephen M.; and Bach, Lloyd G., to Bendix Corporation, The. Spool valve for hydraulic brake booster. 3,945,301, Cl. 91-442.000.

Bukac, Zbynek; and Sebenda, Jan, to Ceskoslovenska akademie ved. Preparing polyamides by anionic polymerization of lactams. 3,945,984, Cl. 260-78.00L.

Burgess, Brian; Bayliss, Raymond Terence; Stokes, Peter Bryan; and Eynon, George Thomas, to Imperial Metal Industries (Kynoch) Limited. Flexible duct assemblies. 3,945,573, Cl. 239-265.350.

Burk, Emmett H., Jr.: *See*—
Fuger, Karl E.; and Burk, Emmett H., Jr., 3,946,014.

Burkard, Eugene R. Short pants with panel overlap. 3,945,051, Cl. 2-224.00R.

Burns, Leonard Walter: *See*—
Corbishley, George Samuel Anthony; Burns, Leonard Walter; Jack, James; Keenan, John Francis Edmund; and Hobday, Cyril, 3,945,793.

Buro, Paul, to U. S. Philips Corporation. Recorder for electrosensitive record carriers having a segmented counter electrode. 3,946,400, Cl. 346-74.00E.

Buromsky, Vladimir Ivanovich: *See*—
Listov, Petr Nikolaevich; Ganiev, Madzhid Saidovich; Buromsky, Vladimir Ivanovich; Bogdanova, Lidia Ivanovna; Kalafatov, Enver Tefikovich; Topalidi, Dmitry Nikolaevich; Rodionov, Vitaly Petrovich; Junusov, Edem Idrisovich; and Fedorov, Valery Pavlovich, 3,945,179.

Burroughs Corporation: *See*—
Beery, Jack; and Wisner, Daniel A., 3,946,285.
Braun, Robert E.; Jones, Richard H.; Sprenkle, George J.; and Stopper, Herbert, 3,946,276.
Millben, Lawrence A., 3,946,254.

Burt, David A., to ITW Limited. Cable tension relievers. 3,945,594, Cl. 248-74.00A.

Busbach, Willi, to Bergwerksverband GmbH. Arrangement for preventing the escape of dust and gas during the filling of a furnace. 3,945,515, Cl. 214-35.00R.

Busch, Wolfgang: *See*—
Tauscher, Manfred; Goring, Joachim; Busch, Wolfgang; and Rohte, Oskar, 3,946,013.

Bush, Charles J., to New York City Transit Authority. Spring rail plate fasteners for direct railroad track fixation. 3,945,566, Cl. 238-349.000.

Buss, Dennis Darcy, to Texas Instruments Inc. Dispersion compensated circuitry for analog charged systems. 3,946,248, Cl. 307-221.00D.

Bussi, Giancarlo; and Baradel, Pierpaolo, to Aquila S.P.A. Utilization of amido-acids for the production of aqueous fluids for the working of metals. 3,945,931, Cl. 252-32.500.

Butler, Lee D.: *See*—
Olsen, James A.; and Butler, Lee D., 3,945,507.

Butts, Ernest O.; and Hall, John S., to Hambro Structural Systems Limited. Reusable spanner bar. 3,945,168, Cl. 52-720.000.

Buzzi, Riccardo. Machine for automatically filling and sealing bags. 3,945,173, Cl. 53-188.000.

Bychowski, William E. Scented christmas tree ornament. 3,945,568, Cl. 239-57.000.

Byers, Gary L.: *See*—
Byers, John E.; and Byers, Gary L., 3,945,753.

Byers, John E.; and Byers, Gary L. Drill bit device. 3,945,753, Cl. 408-201.000.

Bywater, Alan W. Water barrier for floor safes or the like. 3,945,329, Cl. 109-68.000.

C.E.S. (Grinding Machines) Limited: *See*—
Williams, David Godfrey, 3,945,153.

C. Hager & Sons Hinge Manufacturing Company: *See*—
Peterson, Francis C., 3,945,670.

C. R. Bard, Inc.: *See*—
Deaton, David W.; Brower, Stephen M.; and Durham Jr., Marshall P., 3,945,392.

C-R-O Engineering Co., Inc.: *See*—
Hooper, Harry, 3,945,236.

Calcagno, Benedetto; Divo, Claudio; and Ghirga, Marcello, to Societa Italiana Resine S.I.R. S.p.A. Process for the production of vinyl acetate from ethylene. 3,946,068, Cl. 260-497.00A.

Calgon Corporation: *See*—
Martin, Fred David, 3,945,929.

Callery, Thomas R. Mixing method and means. 3,945,617, Cl. 259-54.000.

Calvert, Harry B. Method and means for stacking veneer sheets. 3,945,634, Cl. 271-183.000.

Calviac, Jean-Pierre, to Automobiles Peugeot; and Regie Nationale des Usines Renault. Camshaft device for an internal combustion engine having a variable distribution. 3,945,355, Cl. 123-90.180.

Cameron Balloons Limited: *See*—
Cameron, Donald Allan, 3,945,591.

Cameron, Donald Allan, to Cameron Balloons Limited. Hot air balloons. 3,945,591, Cl. 244-98.000.

Camras, Marvin, to IIT Research Institute. Magnetic recording system. 3,946,147, Cl. 178-5.600.

Canadian Patents and Development Limited: *See*—
Clarke, Michael R.; and Desai, Raman, 3,945,834.
Clarke, Michael R.; and Rak, Jaromir R., 3,945,835.

Canon Denshi Kabushiki Kaisha: *See*—
Saito, Takeshi, 3,946,440.
Taniguchi, Tadasu; Hosaka, Iwao; and Yoshida, Shigeru, 3,946,202.
Taniguchi, Tadasu; Hosaka, Iwao; and Yoshida, Shigeru, 3,946,204.

Canon Kabushiki Kaisha: *See*—
Ito, Yoshio; Takahashi, Toru; Ishihara, Takayuki; Kobayashi, Hiroo; and Matsuoka, Atsushi, 3,945,726.
Moriyama, Inao; Tanaka, Keiji; Yujiro, Ando; and Ohara, Katsunobu, 3,945,725.
Saito, Takeshi, 3,946,440.
Taguchi, Tatsuya, 3,946,408.
Taniguchi, Tadasu; Hosaka, Iwao; and Yoshida, Shigeru, 3,946,202.
Taniguchi, Tadasu; Hosaka, Iwao; and Yoshida, Shigeru, 3,946,204.
Tanikoshi, Kinji, 3,946,292.

Canon Seiki Kabushiki Kaisha: *See*—
Tanikoshi, Kinji, 3,946,292.

Capaldi, Eugene C.: *See*—
Borchert, Alfred E.; Capaldi, Eugene C.; and Ballard, Donnell A., 3,945,941.

Cappiello, Pierre: *See*—
Darredeau, Bernard; Cappiello, Pierre; and Le Bihan, Herve, 3,945,214.

Carbonero, Fred L. Swimmer's aid. 3,945,068, Cl. 9-310.00J.

Carbonero, Fred L. Net and paddle ball game apparatus. 3,945,641, Cl. 273-95.00R.

Carborundum Company, The: *See*—
Beckner, Wilbur Ripple, 3,945,150.

Cardinal, Thomas J., to Pillsbury Company, The. Shrink wrap system for products on pallets and slip sheets. 3,945,493, Cl. 206-386.000.

Carl Walther, Sportwaffenfabrik: *See*—
Keppeler, Dieter, 3,945,142.

Carley, Wesley B. K. Tractor-mounted logging winch. 3,945,517, Cl. 214-85.500.

Carlson, Bertil V.; and Zapf, Donald C., to United States of America, Navy. Through-bulkhead explosion initiation. 3,945,322, Cl. 102-70.00R.

Carmody, William D.; Park, William Robb Roy; and Gould, Gordon E., to Dow Chemical Company, The. Household plastic film in roll form and embodying a curled leading edge. 3,945,495, Cl. 206-397.000.

Carnation Company: *See—*
Dziulak, Paul J., 3,946,095.

Carr, Albert A.; and Kinsolving, C. Richard, to Richardson-Merrell Inc. Piperidine derivatives. 3,946,022, Cl. 260-293.640.

Carrico, John P.: *See—*
Moseman, Paul W., Jr.; Passeri, David; and Carrico, John P., 3,946,229.

Carrico, John Paul, to Bendix Corporation, The. Liquid-level sensor utilizing ferromagnetic fluid. 3,946,177, Cl. 200-84.00C.

Carrieres Et Fours A Chaux Dumont-Wautier: *See—*
Dumont, Philippe A., 3,945,841.

Carroll, John Edward: *See—*
Froom, Jocelyn; and Carroll, John Edward, 3,946,336.

Cartier, Peter G.: *See—*
Beasley, Glenn H.; and Cartier, Peter G., 3,945,811.

Carus, Bryce W.: *See—*
Baker, John D.; and Carus, Bryce W., 3,946,311.

Case, John Reginald; and Moore, Geoffrey James, to Imperial Chemical Industries Limited. Manufacture of 1,1'-dialkyl-4,4'-bipyridylium salts. 3,946,023, Cl. 260-294.80R.

Caspari, Fred W., to Magnavox Company, The. Electronic automatic frequency tuning system. 3,946,329, Cl. 331-4.000.

Cassella Farbwerke Mainkur AG: *See—*
Fleckenstein, Erwin; Heinrich, Ernst; and Mohr, Reinhard, 3,946,024.

Castrodale, Daniel Owen; Steele, Steven Gary; Wentink, William Stewart; and Wheeler, Stephen Edward, to International Business Machines Corporation. Recording apparatus for magnetic disks using both sides of the disk. 3,946,439, Cl. 360-105.000.

Catanese, Peter J.: *See—*
Harendza-Harinxma, Alfred J., 3,946,101.

Caterpillar Tractor Co.: *See—*
Booth, Sterling R., Jr.; and Rhoads, Kenneth A., 3,945,693.

CBS Inc.: *See—*
Goldberg, Abraham A.; and Rossi, John P., 3,946,432.
White, James V., 3,946,149.

Ceskoslovenska akademie ved: *See—*
Bukac, Zbynek; and Sebenda, Jan, 3,945,984.

Cecil, Robert J. Threading taps. 3,945,069, Cl. 10-141.00R.

Celanese Corporation: *See—*
Davis, Herbert L.; Jaffee, Michael L.; and Besso, Michael M., 3,946,100.

Central Electricity Generating Board: *See—*
Freck, David Vernon, 3,945,884.

Cerberus AG: *See—*
Zetting, Alois, 3,946,377.

Ceskoslovenska Akademie Ved: *See—*
Simecek, Tomislav; and Sipek, Emil, 3,945,730.

Chadwick-Helmuth Company, Inc.: *See—*
Wilson, William F.; Chadwick, James R.; and Helmuth, James G., 3,945,256.

Chadwick, James R.: *See—*
Wilson, William F.; Chadwick, James R.; and Helmuth, James G., 3,945,256.

Chance Manufacturing Company, Inc.: *See—*
Brown, Joseph Martin, 3,945,659.

Chandler, William R.: *See—*
Lyons, Dianne D.; and Chandler, William R., 3,946,195.

Chandrajain, Satish: *See—*
Khann, Pushpa; Nag, Tej Narain; Chandrajain, Satish; and Mohan, Suchendra, 3,945,988.

Chang, Amos I. T. Traffic flow control systems. 3,945,745, Cl. 404-1.000.

Chapin, Bryan W., to Rodina Energy R & D Corporation. Energy recovery. 3,945,210, Cl. 60-618.000.

Chapman, James K., Jr.: *See—*
Aal, Robert A.; Chen, Norman H. C.; and Chapman, James K., Jr., 3,945,891.

Chellis, Willard B., to Chesapeake and Ohio Railway Company, The. AB freight valve test rack. 3,945,684, Cl. 303-1.000.

Chemical Systems, Inc.: *See—*
Kesting, Robert E., 3,945,926.

Chemische Werke Huels Aktiengesellschaft: *See—*
Berg, Gerhard; Nordsiek, Karl-Heinz; and Barnstedt, Egge, 3,945,978.

Chen, Norman H. C.: *See—*
Aal, Robert A.; Chen, Norman H. C.; and Chapman, James K., Jr., 3,945,891.

Chesapeake and Ohio Railway Company, The: *See—*
Chellis, Willard B., 3,945,684.

Chevron Research Company: *See—*
Choi, Sam Kwon, 3,945,897.
Cleveland, James D., 3,946,062.
Fries, Bernard A., 3,946,237.
Fries, Bernard A., 3,946,238.

Chibnik, Sheldon; and Otto, Ferdinand P., to Mobil Oil Corporation. Metal complexes of nitrogen compounds in fluids. 3,945,933, Cl. 252-33.300.

Chicago Pneumatic Tool Company: *See—*
Amtsberg, Lester A., 3,945,442.

Chien, Yie W.; and Lambert, Howard J., to G. D. Searle & Co. Microsealed pharmaceutical delivery device. 3,946,106, Cl. 424-15.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT.: *See—*
Mlinko, Sandor; Banfi, Dezso; Gacs, Istvan; Payer, Karoly; Otvos, Laszlo; Vargay, Zoltan; Dobis nee Farkas, Emilia; and Palagyi, Tivadar, 3,945,797.

Chiron, Bernard; Puyhaubert, Jean; and Seguin, Michel, to Societe Lignes Telegraphiques et Telephoniques. Broadband electroacoustic delay lines. 3,946,341, Cl. 333-30.00R.

Chitakyan, Onik Kevork; and Shterev, Mihail Georgiev, to Republikanski Centar sa TNTM. Apparatus for optically pumping lasers with solar energy. 3,946,333, Cl. 331-94.50P.

Chiu, Ying-Chech; and Hill, Harold J., to Shell Oil Company. Process for displacing oil using aqueous anionic surfactant systems containing aromatic ether polysulfonates. 3,945,437, Cl. 166-305.00R.

Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, to Hoffmann-La Roche Inc. Propynyl benzyl ethers. 3,946,040, Cl. 260-340.300.

Choi, Sam Kwon, to Chevron Research Company. Photohalogenation of lactams and certain products thereof. 3,945,897, Cl. 204-158.0HA.

Chou, Sunlin, to Intel Corporation. System for compensating voltage for a CCD sensing circuit. 3,946,368, Cl. 340-173.00R.

Christensen Diamond Products Co.: *See—*
Ostertag, Alfred; and Marx, Claus, 3,945,446.

Christianson, Clinton C.; and Bourke, Robert F., to Gould, Inc. Battery state of charge gauge. 3,946,299, Cl. 320-43.000.

Chrysler Corporation: *See—*
Stimpson, Donald E., 3,945,267.

Ciba-Geigy AG: *See—*
Angliker, Hans-Jorg; Peter, Richard; and Liechti, Hans Wilhelm, 3,945,989.
Corbishley, George Samuel Anthony; Burns, Leonard Walter; Jack, James; Keenan, John Francis Edmund; and Hobday, Cyril, 3,945,793.
Ramanathan, Visvanathan; and Liechti, Hans Wilhelm, 3,945,991.

Ciba-Geigy Corporation: *See—*
Allgeier, Hans; and Gagneux, Andre, 3,946,032.
Gordon, David A.; and Seltzer, Raymond, 3,946,011.
Karrer, Friedrich, 3,946,084.
Nachbur, Hermann; and Maeder, Arthur, 3,946,092.
Porret, Daniel; and Habermeier, Jurgen, 3,946,034.
Wurmli, Albert; and Wachsmann, Hubert, 3,945,792.
Zondler, Helmut, 3,945,953.

Cimarusti, Christopher M., to E. R. Squibb & Sons, Inc. Steroidal bicyclic dioxanes. 3,945,997, Cl. 260-239.55R.

Cincinnati Milacron-Heald Corporation: *See—*
Vaillette, Bernard D., 3,945,694.

Cipres, Henry A., to L. A. Emergency Oxygen, Inc. High-ride conversion member for conventional bicycles. 3,945,667, Cl. 280-7.150.

Cities Service Oil Company: *See—*
Robinson, Franklin H.; Rakow, Marvin S.; and Jamieson, Ernest, 3,946,053.

Citizen Watch Co., Ltd.: *See—*
Kimura, Satoshi; Mochizuki, Yoshifumi; and Yasuda, Tetsuya, 3,945,190.
Yasuda, Tetuya; and Iinuma, Yoshio, 3,945,193.

Clairborne, Lewis T.: *See—*
Collins, Dean Robert; and Clairborne, Lewis T., 3,946,247.

Clairmonte Bros., Limited: *See—*
Clairmonte, Edward Hugh, 3,945,531.

Clairmonte, Edward Hugh, to Clairmonte Bros., Limited. Pay-out devices. 3,945,531, Cl. 222-27.000.

Clark, Chester G., to Oxy Metal Industries Corporation. Apparatus for counterflow rinsing of workpieces. 3,945,388, Cl. 134-57.00R.

Clark Equipment Company: *See—*
Visser, Peter J., 3,945,673.

Clark, Vincent de Paul, to Owens-Corning Fiberglas Corporation. Coating composition of flame retardant filler, latex binder and water soluble fire retardant borate. 3,945,962, Cl. 260-29.6MM.

Clarke, Michael R.; and Desai, Raman, to Canadian Patents and Development Limited. Aqueous compositions for lumber treatment. 3,945,834, Cl. 106-15.00R.

Clarke, Michael R.; and Rak, Jaromir R., to Canadian Patents and Development Limited. Heavy duty aqueous wood preservative. 3,945,835, Cl. 106-15.00R.

Clarkson, Curtis W., to J. R. Clarkson Company, The. Packingless gate valve and actuator assemblies. 3,945,604, Cl. 251-174.000.

Claudel S.A.: *See—*
Stenne, Pierre, 3,945,310.

Claus, William D., Jr.: *See—*
Durand, Philip E.; McManus, Lawrence R.; and Claus, William D., Jr., 3,945,122.

Clayton Dewandre Company Limited: *See—*
Page, Wilbur Mills; and Applewhite, Phillip, 3,945,685.
Page, Wilbur Mills; and Applewhite, Phillip, 3,945,691.

Cleveland, James D., to Chevron Research Company. Preparation of 2-chlorocycloalkylthio urea compounds. 3,946,062, Cl. 260-453.00R.

Climalene Company, The: *See—*
Gargione, Frank V., 3,945,060.

Clogg, William G., to Kent-Moore Corporation. Catalytic converter cannister emptying and filling device. 3,945,410, Cl. 141-67.000.

Closmann, Philip J.; Drinkard, Gary; Street, Evan H.; Templeton, Charles C.; and Tham, Min Jack, to Shell Oil Company. Subterranean oil shale pyrolysis with permeating and consolidating steps. 3,945,679, Cl. 299-5.000.

Coates Brothers & Company Limited: *See*—
Jones, David Vernon Hudson, 3,946,129.
Cochran, David S.: *See*—
Rode, France; Crowley, William L., Jr.; Walker, Alexander D. R.; and Cochran, David S., 3,946,218.
Cocker, Peter; and Price, Michael Anthony, to British Nuclear Fuels Limited. Means for supporting nuclear fuel. 3,945,885, Cl. 176-78.000.
Cockroft, Darrel. Key cutting machine. 3,945,298, Cl. 90-13.050.
Codomo, Joseph; and Thorson, Eric K., to Eldec Corporation. Method and apparatus for sensing, storing, and graphically displaying overtemperature conditions of jet engines. 3,946,364, Cl. 340-172.500.
Colbath, Dan L. Roll-stand for roll-forming machine. 3,945,232, Cl. 72-181.000.
Colbridge, Thomas D.: *See*—
Saul, Samuel, Jr.; and Colbridge, Thomas D., 3,945,510.
Colgate-Palmolive Company: *See*—
Tomlinson, Kenneth; and Harrison, Michael, 3,946,108.
Colin, Jean-Paul, to Societe Anonyme dite: Ateliers et Chantiers de Bretagne-A C B. Devices for transferring heavy loads at sea. 3,945,508, Cl. 214-13.000.
Collins, Brain Stanley. Rotary internal combustion engine with cam transmission. 3,945,358, Cl. 123-56.0AA.
Collins, Dean Robert; and Clairborne, Lewis T., to Texas Instruments Inc. Analogue shift register correlators. 3,946,247, Cl. 307-221.00D.
Collins, Thomas Robert Stephen, to Imperial Chemical Industries Limited. Injection moulding machinery. 3,945,784, Cl. 425-130.000.
Colson, Donald W., to Viking Pallet Corporation. Automatic stitch nailing apparatus. 3,945,549, Cl. 227-45.000.
Combustion Engineering, Inc.: *See*—
Leshem, Adam, 3,946,258.
Commissariat A l'Energie Atomique: *See*—
Allera, Jean-Louis; Bergeri, Jacques; Perroud, Paul; Pleyber, Gaetan; and Violet, Jean-Louis, 3,946,224.
Lemercier, Guy, 3,945,165.
Lemercier, Guy, 3,945,887.
Commonwealth Scientific & Industrial Research Organization: *See*—
Allen, Lindsay Alfred, 3,945,189.
Communications Satellite Corporation: *See*—
Husted, John M.; Gabbard, Ova Gene; and Schmidt, William G., 3,946,161.
Compaction Technology (Proprietary) Limited: *See*—
Berrange, Aubrey R., 3,945,748.
Compactor Company, Inc.: *See*—
Hennells, Ransom J., 3,945,314.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Alais, Michel, 3,945,854.
Computer Power, Inc.: *See*—
Love, Roger R., 3,946,301.
Conco Inc.: *See*—
Feld, Arnold W., 3,946,293.
Concrete Pipe Machinery Company: *See*—
Walchek, Ronald J., 3,945,787.
Conder International Limited: *See*—
Brown, David James, 3,945,306.
Condevaux, Georges Julien. Device for assembling sectional for instance metallic bars. 3,945,742, Cl. 403-255.000.
Conrad, Jens; Eckert, Hans Werner; Saygin, Ferdi; and Schnegelberger, Harald, to Henkel & Cie GmbH. Adducts of epoxy compounds and products of reaction of e-caprolactam with N-alkylalkylenediamine and methods of preparation. 3,945,996, Cl. 260-239.30R.
Consolidated Brass Company: *See*—
Dashner, James W., 3,945,607.
Container Corporation of America: *See*—
Graham, James R., Jr., 3,945,557.
Continental Can Company, Inc.: *See*—
Ostrem, Obert M.; and Kulikowski, Donald F., 3,945,334.
Continental Gummi-Werke Aktiengesellschaft: *See*—
Kosanke, Johannes, 3,945,419.
Simonsen, Harald; and Brautigam, Jurgen, 3,945,263.
Cook, Danny G. Rotary valve for internal combustion engine. 3,945,364, Cl. 123-190.0BD.
Cook, John Hayward; and Wales, John, to Xerox Corporation. Resilient roller. 3,945,723, Cl. 355-3.00R.
Cook, Koy B., Jr., to Harris Corporation. Normally off schottky barrier field effect transistor and method of fabrication. 3,946,415, Cl. 357-15.000.
Cook, Neal A.: *See*—
Costello, Norman F.; and Cook, Neal A., 3,945,805.
Costello, Norman F.; and Cook, Neal A., 3,945,806.
Cook, Orville Lee. Apparatus for removing mortar from used brick. 3,945,151, Cl. 51-26.000.
Cook, Virgil W.; Spates, Charles D.; Heil, Charles Wayne, deceased; by Heil, Terry W., executor; and Diers, executrix by Kay A., to American Chain & Cable Company, Inc. Loom cleaner. 3,945,081, Cl. 15-312.00R.
Cook, William H., Jr., to Dow Chemical Company, The. Process for preparation of urea autocondensation product. 3,946,073, Cl. 260-553.00B.
Cooper, Darryl B., to Glass Containers Corporation. Container supporting and transporting device. 3,945,486, Cl. 198-179.000.
Cooper, Duane H. Method and apparatus for control of crosstalk in multiple frequency recording. 3,946,165, Cl. 179-100.1TD.
Cooper, George W., to Fruehauf Corporation. Crane with a variable center rope suspension system. 3,945,503, Cl. 212-11.000.
Cooper, Robin D. G., to Eli Lilly and Company. Hydroxy substituted phenylglycylamido-3-heterocyclic thiomethyl cephalosporins. 3,946,003, Cl. 260-243.00C.
Cooperative Marketing Co., The: *See*—
Krautsack, Richard G., 3,945,559.
Corbishley, George Samuel Anthony; Burns, Leonard Walter; Jack, James; Keenan, John Francis Edmund; and Hobday, Cyril, to Ciba-Geigy AG. Process for the colouration of acid-modified synthetic textile fibers and acrylic fibers. 3,945,793, Cl. 8-168.00A.
Corcoran, Donald G., to International Telephone and Telegraph Corporation. Group display system. 3,945,721, Cl. 353-84.000.
Correa, Affonso Henriques. Location indicator for lost aircraft. 3,945,338, Cl. 116-124.00B.
Corsette, Douglas F. Toilet chemical dispenser. 3,945,062, Cl. 4-227.000.
Costello, Norman F.; and Cook, Neal A., to Modine Manufacturing Company. Reactor-generator apparatus. 3,945,805, Cl. 23-290.000.
Costello, Norman F.; and Cook, Neal A., to Modine Manufacturing Company. Reactor-generator. 3,945,806, Cl. 23-290.000.
Cramer, Jerry W.: *See*—
Paddock, Paul F.; and Cramer, Jerry W., 3,945,489.
Crandell, Melvin G., to Xerox Corporation. Alarm for an electrophotographic printing machine. 3,945,728, Cl. 355-75.000.
Crawford, James J.: *See*—
Frezzolini, James; and Crawford, James J., 3,946,260.
Creusot-Loire: *See*—
Malot, Andre, 3,945,750.
Creutz, Hans Gerhard: *See*—
Martin, Sylvia; Creutz, Hans Gerhard; and Becking, Donald Harvey, 3,945,894.
Crock, Gerard William; and Pericic, Ljubomir, to University of Melbourne. Operating magnifier and miniature opthalmoscope. 3,945,712, Cl. 351-6.000.
Crompton, George. Amphibious dirigible airships. 3,945,589, Cl. 244-30.000.
Crompton & Knowles Corporation: *See*—
Wueger, Karl W., 3,945,406.
Cross, Donald M.: *See*—
Wilson, Clyde H.; Cross, Donald M.; Dupuy, James A.; and Tarrant, Duel J., 3,945,450.
Cross, Kenneth O.: *See*—
Hohwart, George; Toth, Paul; and Cross, Kenneth O., 3,945,652.
Crowder, Thomas T. Hand launch glider. 3,945,147, Cl. 46-76.00R.
Crowe, David F.; Peters, Richard H.; Tanabe, Masato; and Detre, George, to Stanford Research Institute. 19-Norpregna- 1,3,5(10)-trien-3-ol and loweralkyl homologs thereof having postcoital antifertility activity. 3,946,052, Cl. 260-397.500.
Crowell, Merton Howard, to North American Philips Corporation. Infra-red responsive camera tube. 3,946,264, Cl. 313-388.000.
Crowley, William L., Jr.: *See*—
Rode, France; Crowley, William L., Jr.; Walker, Alexander D. R.; and Cochran, David S., 3,946,218.
Cruttwell, Ian Andrew; and Smith, David Theo, to Image Analysing Computers Limited. Image analysis. 3,946,361, Cl. 340-146.3AC.
Cruz, Alcides. Edging guide. 3,945,747, Cl. 404-7.000.
Cryogenic Technology, Inc.: *See*—
Johnson, Robert W.; and Doherty, Paul R., 3,945,215.
Cuckler, Virgil A.; and Yost, Russell R., Jr., to Motorola, Inc. Buoy antenna system. 3,946,391, Cl. 343-709.000.
Cumberland Packing Corporation: *See*—
Eisenstadt, Marvin E., 3,946,121.
Cummens, Joseph R., to Onsrud Machine Works, Inc. Turbine type air motor. 3,945,757, Cl. 415-80.000.
Cummins Engine Company, Inc.: *See*—
Downs, Ronald, 3,945,302.
Curry, John B.: *See*—
Paszyc, Aleksy J.; Pal, Dharam; and Curry, John B., 3,945,920.
Cutter Laboratories, Inc.: *See*—
Dabney, William C.; Kristoff, Basil L.; Tuseth, Robert D.; and Hink, John H., 3,945,380.
D. Ayres Jones & Company Limited: *See*—
Wightman, John Clifford, 3,945,538.
Dabney, William C.; Kristoff, Basil L.; Tuseth, Robert D.; and Hink, John H., to Cutter Laboratories, Inc. Plasmapheresis assembly. 3,945,380, Cl. 128-214.00R.
Dahan, Gilbert: *See*—
Gaudilliere, Jean-Louis; and Dahan, Gilbert, 3,945,623.
Dahlem, Peter; and Milles, Hubert, to Lindemann Maschinenfabrik GmbH. Hydraulic scrap shearing machine. 3,945,315, Cl. 100-95.000.
Dai Nippon Printing Co., Ltd.: *See*—
Noshiro, Atsumi; and Inoue, Yoshio, 3,945,957.
Daimler-Benz Aktiengesellschaft: *See*—
Ableitner, Erich, 3,945,357.
Dalzell, Haldean Cloyce: *See*—
Winn, Martin; Razdan, Raj Kumar; Dalzell, Haldean Cloyce; and Krei, Joyce Ruth, 3,946,111.
Danfoss A/S: *See*—
Olsen, Carl Ivar, 3,945,457.
Thorsoe, Flemming, 3,946,304.
Daniels, Elon, Jr.; and Kline, Richard H., to General Motors Corporation. Apparatus for making expanded metal lead-acid battery grids. 3,945,097, Cl. 29-2.000.
Daniels, John F.; Melito, Maurice A., Jr.; and Szymansky, Edward, to Sperry Rand Corporation. Skin engaging means for an electric dry shaver. 3,945,115, Cl. 30-34.200.

Daniels, Phillip S., Jr. Rotary diesel engine. 3,945,346, Cl. 123-8.470.
Daran, Jose Luis Davila; Sanchez, Mario C. Zamorano; and Hernandez, Antonio Ovando. System for the inhumation of corpses. 3,945,094, Cl. 27-11.000.
Darjany, John C., to R. D. Products, Inc. Magnetic-type information card and method and apparatus for encoding and reading. 3,946,206, Cl. 235-61.11D.
Darredeau, Bernard; Cappiello, Pierre; and Le Bihan, Herve, to Societe des Procedes l'Air Liquide et Technip de Liquefaction des Gaz Naturels. Method and apparatus for cooling a gas. 3,945,214, Cl. 62-54.000.
Dart Environment and Services Company: *See—*
Kamperman, David Robert, 3,945,865.
Dashner, James W., to Consolidated Brass Company. Pressure safety valve. 3,945,607, Cl. 251-357.000.
Datatype Corporation: *See—*
Melugin, Leland A.; and Parchesky, Joseph, 3,946,205.
Davies, Robert Henry. Single-point mooring systems. 3,945,066, Cl. 9-8.00P.
Davis, George B., Jr. Christmas tree lighting control. 3,946,244, Cl. 307-31.000.
Davis, Herbert L.; Jaffee, Michael L.; and Besso, Michael M., to Celanese Corporation. Process for the expeditious formation and structural modification of polyester fibers. 3,946,100, Cl. 264-210.00F.
Davison, Michael; Frankham, David Binfield; and Spence, Thomas William Matches, to Lilly Industries Limited. Process for preparing cephalosporins. 3,946,002, Cl. 260-243.00C.
Day, Clifford K.; and Koerber, George G., to Iowa State University Research Foundation, Inc. System for generating or sensing transverse elastic bulk waves in solids. 3,946,256, Cl. 310-9.500.
de la Bretonieri, Andre B. Building comprising one or more rooms or confined spaces equipped with an electric heating installation, and/or an electric heating installation for this building, equipped with a heating device. 3,946,194, Cl. 219-213.000.
Deak, Gyula; Doda, Margit; Gyorgy, Lajos; Hazai, Laszlo; and Pfeifer, Klara, deceased (by Mihaly, Gyorgy, residuary legatee), to Egyt Gyogyszervegyeszeti Gyar. 1,4-Dihydro-3 (2H)-isoquinolinone derivatives. 3,946,018, Cl. 260-287.00D.
DeAngelis, Armand, to Omnitech Inc. Flip-up visor assembly for helmet. 3,945,043, Cl. 2-8.000.
Deaton, David W.; Brower, Stephen M.; and Durham Jr., Marshall P., to C. R. Bard, Inc. Disposable safety float valve. 3,945,392, Cl. 137-205.000.
De Ceuster, Jean; and Grassi, Bruno, to Solvay & Cie. Diaphragm for an electrolysis cell. 3,945,910, Cl. 204-296.000.
Decker, Warren L. Rotable trailer. 3,945,521, Cl. 214-506.000.
de Hedouville, Philippe, to U.S. Philips Corporation. Tub and drum of a washing-machine. 3,945,226, Cl. 68-23.100.
de Jong, Wilhelmus Maria, to Quick-Rotan Becker & Notz KG. Motor construction. 3,945,476, Cl. 192-12.00D.
Delaunois, Yvon; Hestermans, Pierre; Leroy, Georges; Peerts, Fernand; and Wilante, Claude, to Tessenderlo Chemie S.A. Halogenated aromatic ethers. 3,946,083, Cl. 260-611.00A.
del Castillo, Juan M. Optical metronome. 3,945,292, Cl. 84-484.000.
Delfosse, Gilbert; and Andiano, Jose, to Massey-Ferguson Services N.V. Crop harvesting and threshing machines. 3,945,178, Cl. 56-14.600.
De Loach, Bernard Collins, Jr.; and DiDomenico, Mauro, Jr., to Bell Telephone Laboratories, Incorporated. Stabilization circuit for radiation emitting diodes. 3,946,335, Cl. 331-94.50S.
Delorme, Ernest. Asphalt storage system. 3,945,511, Cl. 214-17.00C.
Delvecchio, Leonard P.: *See—*
Goff, Randall; and Delvecchio, Leonard P., 3,946,176.
DelVecchio, William D.: *See—*
Bleyle, Merrill; DelVecchio, William D.; and Trofimow, Alex, 3,946,139.
Demag Aktiengesellschaft: *See—*
Moslener, Jorn, 3,945,585.
Demarest, Douglas M.: *See—*
Doubleday, Max; and Demarest, Douglas M., 3,945,602.
Demole, Edouard P., to Firmenich SA. Flavouring and perfuming ingredients. 3,946,050, Cl. 260-348.00R.
Demole, Edouard P., to Firmenich SA. Flavouring and perfuming ingredients. 3,946,080, Cl. 260-593.00R.
den Hertog, Willem Cornelis; and Rolleman, Geert, to Wavin B.V. Extruder with hydrostatic bearing. 3,945,621, Cl. 259-191.000.
Denmark, James, to Subbuteo Sports Games Limited. Mounting for figures. 3,945,640, Cl. 273-85.00R.
Derby, Palmer P., to Raytheon Company. Microwave heating apparatus with browning feature. 3,946,188, Cl. 219-10.55E.
Derderian, George: *See—*
Mohon, Windell N.; Derderian, George; and Breglia, Denis R., 3,945,133.
Derevyankin, Nikolai Efimovich; Evseev, Vladimir Ivanovich; Zhuchkov, Ivan Ilich; Samoilov, Oleg Borisovich; and Ovechkin, Alexandr Vasilievich. Control rod for nuclear reactor. 3,945,886, Cl. 176-86.00R.
Desai, Raman: *See—*
Clarke, Michael R.; and Desai, Raman, 3,945,834.
Descamps, Margel; and Inion, Henri, to Labaz. Indole derivatives. 3,946,029, Cl. 260-296.00B.
DeSoto, Inc.: *See—*
Rokadia, Abdullah M., 3,945,767.
Detre, George: *See—*
Crowe, David F.; Peters, Richard H.; Tanabe, Masato; and Detre, George, 3,946,052.
Detroit Edison Company, The: *See—*
Anderson, Clarence A.; and Taylor, Frank L., 3,946,243.
Dettling, Joseph C.: *See—*
Hindin, Saul G.; and Dettling, Joseph C., 3,945,946.
Deutsche Gold-und Silber-Scheideanstalt vormals Roessler: *See—*
Asinger, Friedrich; Pfeifer, Wolf Dieter; Offermanns, Heribert; Scherberich, Paul; and Schreyer, Gerd, 3,946,069.
Schindewolf, Ulrich, 3,945,919.
Deutsche Texaco Aktiengesellschaft: *See—*
Kunert, Maximilian; and Wegner, Hans-Georg, 3,945,912.
Devron Engineering Ltd.: *See—*
Dove, Norman F., 3,945,570.
Dewar, Bruce Ian: *See—*
James, George Stephen; Dewar, Bruce Ian; and Moergeli, Walter Rudolf, 3,945,892.
Dewey, Herbert F. Sheet metal strip roller apparatus. 3,945,233, Cl. 72-181.000.
Dewhurst & Partner Limited: *See—*
Minns, George Eric, 3,945,470.
DeWitt, David; and Johnson, William S., to International Business Machines Corporation. Field effect transistor structure for minimizing parasitic inversion and process for fabricating. 3,946,419, Cl. 357-23.000.
Dexter, Robert G. Hydraulic linkage. 3,945,209, Cl. 60-546.000.
Dey, Arabinda N., to P. R. Mallory & Co. Inc. Miniature concentric battery. 3,945,846, Cl. 136-100.00R.
Dey, Arabinda N.; and Holmes, Robert W., to P. R. Mallory & Co. Inc. Lithium-metal oxide organic electrolyte systems. 3,945,848, Cl. 136-100.00R.
Dey, Arabinda N., to P. R. Mallory & Co. Inc. Current collector for organic electrolyte batteries. 3,945,852, Cl. 136-135.00R.
Diamond Shamrock Corporation: *See—*
Ihde, Frederick J., Jr., 3,945,955.
Nessar, Joseph D., 3,945,901.
Didier, Robert G., to Boston Insulated Wire & Cable Co. Connector with fluid-resistant sleeve assembly. 3,945,700, Cl. 339-59.00M.
DiDomenico, Mauro, Jr.: *See—*
De Loach, Bernard Collins, Jr.; and DiDomenico, Mauro, Jr., 3,946,335.
Diehl, Francis Louvaine: *See—*
Lucas, Malcolm Bramel; McKenna, James Francis; and Diehl, Francis Louvaine, 3,945,936.
Diehl, Karl-Heinz: *See—*
Eggensperger, Heinz; and Diehl, Karl-Heinz, 3,946,006.
Diener, Robert W. Cable lifting device. 3,945,502, Cl. 212-8.00B.
Dieringer, Andrew M., to Rexnord, Inc. Circuit for controlling damp shock loading. 3,946,284, Cl. 317-123.000.
Diers, executrix by Kay A.: *See—*
Cook, Virgil W.; Spates, Charles D.; Heil, Charles Wayne, deceased; Heil, Terry W., executor; and Diers, executrix by Kay A., 3,945,081.
Dietz, Wolfgang Friedrich Wilhelm, to RCA Corporation. Side pincushion correction circuit. 3,946,274, Cl. 315-371.000.
Diewald, Gunther: *See—*
Mayer, Cornelius; Diewald, Gunther; and Reber, Heinrich, 3,945,321.
Dinkel, Ernest Josef: *See—*
Weiss, Hubert Leger; and Dinkel, Ernest Josef, 3,946,282.
Dittmar, Wilfried, to Wersi-electronic GmbH & Co. KG. Device for producing a vibrato effect for accoustic signals. 3,945,290, Cl. 84-1.250.
Divo, Claudio: *See—*
Calcagno, Benedetto; Divo, Claudio; and Ghirga, Marcello, 3,946,068.
Doak, Gerald. Sanitizing and cleaning device for pressurized soft drink systems and the like. 3,945,536, Cl. 222-148.000.
Doan, John R. Anchorable pack-off assembly. 3,945,774, Cl. 417-554.000.
Doane, DeWitt H. Method of filtering grease-laden air. 3,945,812, Cl. 55-97.000.
Dobis nee Farkas, Emilia: *See—*
Mlinko, Sandor; Banfi, Dezso; Gacs, Istvan; Payer, Karoly; Otvos, Laszlo; Vargay, Zoltan; Dobis nee Farkas, Emilia; and Palagyi, Tivadar, 3,945,797.
Doda, Margit: *See—*
Deak, Gyula; Doda, Margit; Gyorgy, Lajos; Hazai, Laszlo; and Pfeifer, Klara, deceased, 3,946,018.
Dodson, Stokes R., Jr.: *See—*
Rudder, Walter H.; Braden, William D., deceased; McEvoy, Charles J.; Dodson, Stokes R., Jr.; Thiele, John R.; and Livgren, Allen L., 3,945,866.
Doherty, Paul R.: *See—*
Johnson, Robert W.; and Doherty, Paul R., 3,945,215.
Doi, Yoshikazu; Kishikawa, Toshiro; and Yamada, Hiroshi, to Fuji Photo Optical Co., Ltd. Image rotating optical system. 3,945,713, Cl. 350-54.000.
Doleman, Jack. Molding apparatus to form a three dimensional product on a web material. 3,945,781, Cl. 425-115.000.
Domtar Limited: *See—*
Anczurowski, Edward; and Julien, Brian E., 3,945,386.
Donath, Ernest E., to United States of America, Energy Research and Development Administration. Method and apparatus for removing coarse unentrained char particles from the second stage of a two-stage coal gasifier. 3,945,809, Cl. 48-73.000.
Dorcich, Roy L. Escape elevator. 3,945,469, Cl. 187-6.000.

Dorgnon, Roger. Piston actuated fastening gun. 3,945,548, Cl. 227-8.000.
Doroschenko, Pavel Petrovich: *See—*
Milman, Boris Samoilovich; Mirzoian, Genrikh Sergeevich; Strizhov, Gennady Sergeevich; Tinyakov, Viktor Gurievich; Doroschenko, Pavel Petrovich; Karssky, Vladimir Evgenievich; Levin, Moisei Markovich; Krapukhin, Viktor Mikhailovich; and Semenov, Pavel Vladimirovich, 3,945,427.
Dorr-Oliver Incorporated: *See—*
Klinkowski, Peter R., 3,945,900.
Dose, Gerhard, to Fried, Krupp Gesellschaft mit beschrankter Haftung. Gripping apparatus of a lifting device, especially in a core reactor for setting down and lifting fuel elements and fuel rods. 3,945,514, Cl. 214-27.000.
Doss, Daniel L.: *See—*
Solie, James C.; Doss, Daniel L.; and Waldrop, Jerald Lee, 3,945,610.
Doubleday, Max; and Demarest, Douglas M., to Harsco Corporation. Gang tie holding bolt. 3,945,602, Cl. 249-219.00R.
Douglass Manufacturing Company, Inc.: *See—*
Falkenberg, Douglass R., 3,945,264.
Dove, Norman F., to Devron Engineering Ltd. Steam supply apparatus. 3,945,570, Cl. 239-135.000.
Dover, Thomas J.; and Thompson, Walter F., to General Cable Corporation. Twisting machine flyer bow. 3,945,182, Cl. 57-58.520.
Dow Chemical Company, The: *See—*
Barron, Benny Gene, 3,945,939.
Carmody, William D.; Park, William Robb Roy; and Gould, Gordon E., 3,945,495.
Cook, William H., Jr., 3,946,073.
Garner, Joseph L., 3,945,956.
Goralski, Christian T.; and Klingler, Thomas C., 3,946,007.
Smith, Harry A.; and Bozzi, Edward G., Jr., 3,945,973.
Downs, Ronald, to Cummins Engine Company, Inc. Diaphragm adjustment tool. 3,945,302, Cl. 92-13.200.
Drake, Dale E.; and Nelson, Jerry J., to Enertherm, Inc. Thermal recovery system. 3,945,331, Cl. 110-7.00R.
Drake, Marvin D., to Harris-Intertype Corporation. Electro-optical birefringence device employing edge effect. 3,945,715, Cl. 350-150.000.
Dreisin, Alexander, to Allis-Chalmers Corporation. Two phase nozzle cooling system. 3,945,353, Cl. 123-41.220.
Dresser Industries, Inc.: *See—*
Goff, Randall; and Delvecchio, Leonard P., 3,946,176.
Dreyfus, Jean Albert. Speech recognition device for controlling a machine. 3,946,157, Cl. 179-1.0SA.
Drinkard, Gary: *See—*
Closmann, Philip J.; Drinkard, Gary; Street, Evan H.; Templeton, Charles C.; and Tham, Min Jack, 3,945,679.
Drucker, Elliott H., to Boeing Company, The. Method and apparatus for adjustment of modulation course patterns in a navigational system. 3,946,387, Cl. 343-109.000.
Drummond, Arthur, Jr., to Xerox Corporation. Magnetic brush support member. 3,945,342, Cl. 118-637.000.
Drury, Cyril John, to British Leyland UK Limited. Glazing strip. 3,945,161, Cl. 52-208.000.
Dubiel, Oswald: *See—*
Maucher, Paul; and Dubiel, Oswald, 3,945,477.
Duchemin, Michel, to Ressorts Du Nord S. A. Leaf spring. 3,945,625, Cl. 267-47.000.
Duckett, William Arthur, to Jonas Woodhead Limited. Oleo/pneumatic levelling struts. 3,945,663, Cl. 280-124.00F.
Dudley, Kenneth W.: *See—*
MacMaster, George H.; and Dudley, Kenneth W., 3,946,187.
Dufaure, Pierre: *See—*
Jacquet, Bernard; Papantoniou, Christos; Dufaure, Pierre; and Mahieux, Claude, 3,946,035.
Duford, Thomas G.: *See—*
Jakimowicz, Christopher; and Duford, Thomas G., 3,945,308.
Dufour, Charles H.; and Hercock, Robert D., to Harris Corporation. Circumferential register assembly. 3,945,266, Cl. 74-401.000.
Dumont, Philippe A., to Carrieres Et Fours A Chaux Dumont-Wautier. Process for obtaining a building material comprising hydrated lime and plaster. 3,945,841, Cl. 106-109.000.
Dunn, Michael L.: *See—*
Figiel, Francis J.; Tepper, Robert J.; and Dunn, Michael L., 3,945,932.
Dunn, Myron: *See—*
Vander Horst, John; and Dunn, Myron, 3,945,465.
Dunne, Thomas P.; and Ruggiero, Richard D., to Raytheon Company. Transponder for use in a radio frequency communication system. 3,946,393, Cl. 343-6.80R.
Du Pont de Nemours, E. I., and Company: *See—*
Bianca, Dominick, 3,945,876.
Griffin, Charles De Witt, 3,945,262.
Osborn, Robert O., 3,945,873.
Dupuy, James A.: *See—*
Wilson, Clyde H.; Cross, Donald M.; Dupuy, James A.; and Tarrant, Duel J., 3,945,450.
Durand, Philip E.; McManus, Lawrence R.; and Claus, William D., Jr., to United States of America, Army. Three dimensional numerical surface descriptor. 3,945,122, Cl. 33-174.00D.
Durham Jr., Marshall P.: *See—*
Deaton, David W.; Brower, Stephen M.; and Durham Jr., Marshall P., 3,945,392.
Durston, John Graham: *See—*
Hind, John Richard; and Durston, John Graham, 3,945,883.
Dushku, Victor A. Lumbering tool. 3,945,065, Cl. 7-14.300.
Dvorak, Jim. Sheet shear. 3,945,287, Cl. 83-628.000.
Dworak, Wilhelm: *See—*
Vlemmings, Jan; and Dworak, Wilhelm, 3,945,779.
Dymo Industries, Inc.: *See—*
Thomson, Morton W.; and Trout, Mitchel A., 3,945,316.
Dynamit Nobel Aktiengesellschaft: *See—*
Janssen, Paul; and Steffen, Klaus-Dieter, 3,946,059.
Dziulak, Paul J., to Carnation Company. Method of restoring the shape of a flexible-shell model. 3,946,095, Cl. 264-36.000.
E M I Limited: *See—*
Hounsfield, Godfrey Newbold, 3,946,234.
E. R. Squibb & Sons, Inc.: *See—*
Cimarusti, Christopher M., 3,945,997.
Treuner, Uwe D.; and Breuer, Hermann, 3,946,001.
Wade, Peter C.; and Vogt, B. Richard, 3,946,010.
Yale, Harry Louis; and Petigara, Ramesh B., 3,946,025.
E-Z Manufacturing Company: *See—*
Wolk, Charles M., 3,945,273.
Eagle Clamp Co., Ltd.: *See—*
Tsuyama, Yoshizo, 3,945,675.
Eastman Kodak Company: *See—*
Young, David J., 3,945,798.
Easwaran, Jairaj; and Foerster, George S., to N L Industries, Inc. Ferrous metal network impregnated with magnesium metal. 3,945,819, Cl. 75-53.000.
Eaton Corporation: *See—*
Rogers, Robert N.; and Saar, Michael O., 3,945,923.
Ebara Manufacturing Co., Ltd.: *See—*
Arakawa, Shinichiro, 3,945,771.
Ebauches S.A.: *See—*
Erard, Raoul-Henri, 3,945,197.
Eberle, Dieter; Hanselmann, Dieter; and Prohaska, Hans, to SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH. Device for indicating the presence of a load on a vehicle seat. 3,946,178, Cl. 200-85.00A.
Eckardt, Helmut: *See—*
Leiste, Hans Peter; and Eckardt, Helmut, 3,945,535.
Eckert, Hans Werner: *See—*
Conrad, Jens; Eckert, Hans Werner; Saygin, Ferdi; and Schnegelberger, Harald, 3,945,996.
Eckert, Konrad, to Robert Bosch GmbH. Exhaust gas purifying apparatus. 3,945,802, Cl. 23-277.00C.
Eckert, Robert L. Clip dispenser and applicator. 3,945,238, Cl. 72-410.000.
Economics Laboratory, Inc.: *See—*
Seiberling, Dale A., 3,946,113.
Edel, Guenter, to A.W. Faber-Castell. Mechanical pencil. 3,945,733, Cl. 401-94.000.
Edwards, Howard W., Jr., to Sanders Associates, Inc. Addressing technique employing both direct and indirect register addressing. 3,946,366, Cl. 340-172.500.
Egelhof, Dieter; and Wolf, Karl, to J. M. Voith GmbH. Stock inlet arrangement for a paper-making machine. 3,945,882, Cl. 162-340.000.
Eggensperger, Heinz; and Diehl, Karl-Heinz, to Sterling Drug Inc. Tetrahydrothiadiazinethiones. 3,946,006, Cl. 260-243.00R.
Eguchi, Tamiyuki: *See—*
Imai, Satoshi; Eguchi, Tamiyuki; and Shimokawa, Masaaki, 3,945,927.
Egyt Gyogyszervegyeszeti Gyar: *See—*
Deak, Gyula; Doda, Margit; Gyorgy, Lajos; Hazai, Laszlo; and Pfeifer, Klara, deceased, 3,946,018.
Eichorn, Roger H., deceased: *See—*
Sullivan, William A., Jr.; and Eichorn, Roger H., deceased, 3,946,230.
Einbinder, Harvey. Orthogonal input keyboards. 3,945,482, Cl. 197-100.000.
Eisen- und Drahtwerk Erlau Aktiengesellschaft: *See—*
Muller, Anton, 3,945,418.
Eisenmann, James R.; Kaminski, Ben E.; and Waddoups, Max E., Jr., to General Dynamics Corporation. Laminated structural article with constituent elements having inherent fracture arrestment capability. 3,946,127, Cl. 428-48.000.
Eisenstadt, Marvin E., to Cumberland Packing Corporation. Calorie-free sweetener without sourness. 3,946,121, Cl. 426-548.000.
Eisenwerk-Gesellschaft Maximilianshutte mbH: *See—*
Brotzmann, Karl; and Fassbinder, Hans Georg, 3,945,820.
Elazar, Shmuel; and Bierbaum, Charles A., to Statham Instruments, Inc. Flow transducers. 3,945,250, Cl. 73-194.0EM.
Eldec Corporation: *See—*
Codomo, Joseph; and Thorson, Eric K., 3,946,364.
Elder, Jerome Earl, to International Paper Company. Paperboard bulk bin. 3,945,558, Cl. 229-23.00R.
Electromagnetic Sciences, Inc.: *See—*
Simon, Joseph William, 3,946,340.
Electronique Marcel Dassault: *See—*
Schifrine, Jean, 3,946,388.
Elektriska Svetsningsaktiebolaget: *See—*
Linden, Sven-Erik; and Schalling, Hans Erik Otto, 3,945,198.
Eli Lilly and Company: *See—*
Cooper, Robin D. G., 3,946,003.
Elliott Brothers (London) Limited: *See—*
Ellis, Stafford Malcolm, 3,945,720.

Ellis, Christopher Ian Arthur: *See*—
Roughton, Charles Lyn; and Ellis, Christopher Ian Arthur, 3,946,309.

Ellis Corporation: *See*—
Toth, Alex, 3,945,921.

Ellis, Stafford Malcolm, to Elliott Brothers (London) Limited. Map displays. 3,945,720, Cl. 353-12.000.

Elsbery, James W.; and Smith, Raymond Marshall. Strip cleaning mechanism. 3,945,077, Cl. 15-77.000.

Elsbett, Gunter: *See*—
Elsbett, Ludwig; and Elsbett, Gunter, 3,945,349.
Elsbett, Ludwig; and Elsbett, Gunter, 3,945,363.

Elsbett, Ludwig; and Elsbett, Gunter. Air conveying system, especially in the intake line, for successive cylinders of reciprocable piston internal combustion engines. 3,945,349, Cl. 123-30.00C.

Elsbett, Ludwig; and Elsbett, Gunter. Reciprocating piston internal combustion engine with twist forming conduit means, especially in the intake system thereof. 3,945,363, Cl. 123-188.00M.

Emde, Friedhelm: *See*—
Reinke, Friedhelm; Stengel, Edgar; Emde, Friedhelm; and Schwarz, Hans Rudolf, 3,945,483.

Emelianenko, July Georgievich: *See*—
Paton, Boris Evgenievich; Latash, Jury Vadimovich; Medovar, Boris Izrailevich; Emelianenko, July Georgievich; and Kljuev, Mikhail Markovich, 3,945,818.

Emhart Corporation: *See*—
Gerlach, John R., 3,945,671.

Energy Research & Generation, Inc.: *See*—
Walz, Duane D., 3,946,039.

Enertherm, Inc.: *See*—
Drake, Dale E.; and Nelson, Jerry J., 3,945,331.

Engberg, Rolf: *See*—
Isaksson, Ove; and Engberg, Rolf, 3,946,288.

Engelbart, Bernard: *See*—
Schwarcz, Joseph; Engelbart, Bernard; and White, Edward L., 3,945,974.

Engelhard Minerals & Chemicals Corporation: *See*—
Hindin, Saul G.; and Dettling, Joseph C., 3,945,946.

English Electric Valve Company Limited: *See*—
Harmer, Alan Lewis, 3,946,232.

Enody, Emil; Kovacs, Sandor; Gelanyi, Istvan; Karoly, Bela; and Kacsmarek, Bela, to Ateliers J. Hanrez S.A. Apparatus for the control of die heads of presses with movable dies. 3,945,072, Cl. 10-13.000.

Entringer, David C., to Brunswick Corporation. Marine jet drive shift control apparatus. 3,945,201, Cl. 60-222.000.

Environ Control Products, Inc.: *See*—
Johnson, Jerry Dean, 3,945,816.

Erard, Raoul-Henri, to Ebauches S.A. Timepiece. 3,945,197, Cl. 58-59.000.

Erben, Klaus Dieter; Kroy, Walter; and Mehnert, Walter Erich, to Messerschmitt-Bolkow-Blohm GmbH. Weapon system for the detection of and use against stationary or moving objects. 3,946,233, Cl. 250-347.000.

Erco Envirotech Ltd.: *See*—
Lukes, Jerome A.; and Schroeder, Robert P., 3,945,880.

Erickson, Thomas D.; and Wolf, Warren W., to Owens-Corning Fiberglas Corporation. Glass compositions and their fibers. 3,945,838, Cl. 106-50.000.

Ericsson, Bjorn: *See*—
Jysky, Goran; Mardla, Ilmar; and Ericsson, Bjorn, 3,945,613.

Eriksson, Bror Evert. Feeding device. 3,945,413, Cl. 144-246.00R.

Eriksson, Sven Erik Nore, to Atlas Copco Aktiebolag. Loading method. 3,945,519, Cl. 214-152.000.

Ernst Leitz GmbH: *See*—
Jacoby, Hans-Dieter; and Schuster, Erich, 3,945,124.

Erwin Sick Optik-Electronik: *See*—
Walter, Arthur A. W., 3,945,714.

ESB Incorporated: *See*—
Anderson, Kent V.; and Bilhorn, John M., 3,945,853.

Escher Wyss GmbH: *See*—
Kahmann, Albrecht, 3,945,576.

Essington, Harry M. Burner. 3,945,370, Cl. 126-271.300.

Etat Francais: *See*—
Bertolino, Charles, 3,946,355.

EVG Entwicklungs- und Verwertungs-Gesellschaft m.b.H.: *See*—
Scherr, Rudolf; Jamnig, Walter; Gott, Hans; and Ritter, Klaus, 3,945,409.

Evseev, Vladimir Ivanovich: *See*—
Derevyankin, Nikolai Efimovich; Evseev, Vladimir Ivanovich; Zhuchkov, Ivan Ilich; Samoilov, Oleg Borisovich; and Ovechkin, Alexandr Vasilievich, 3,945,886.

Ewen, Harold I., to United States of America, Transportation. Interferometric navigation and guidance system. 3,946,385, Cl. 343-102.000.

Exxon Research & Engineering Co.: *See*—
Leder, Frederic; Kramer, George M.; and Solomon, Herman J., 3,946,088.
McVicker, Gary B., 3,946,082.

Eynon, George Thomas: *See*—
Burgess, Brian; Bayliss, Raymond Terence; Stokes, Peter Bryan; and Eynon, George Thomas, 3,945,573.

F. M. McConnell Ltd.: *See*—
Scott, Donald Alan; and Hudson, Colin, 3,945,177.

Faigen, Ivan M.: *See*—
Smith, Valor C.; Gantsweg, Marvin; and Faigen, Ivan M., 3,946,396.

Fairchild Camera and Instrument Corporation: *See*—
Schinella, Richard D.; and Anthony, Michael P., 3,945,857.

Falchle, Jorg, to Robert Bosch GmbH. Holder for tools and similar objects. 3,945,653, Cl. 279-97.000.

Falkenberg, Douglass R., to Douglass Manufacturing Company, Inc. Reaction support for pulley holddown. 3,945,264, Cl. 74-242.10A.

Farahar, Robert M., to Amey Roadstone Corporation Limited. Concrete pipes. 3,945,782, Cl. 425-127.000.

Farge, Daniel; Goff, Yves le; Messer, Mayer Naoum; and Poiget, Gilbert, to Rhone-Poulenc, S.A. 7H-Indolizino [5,6,7-IJ]isoquinoline derivatives. 3,946,019, Cl. 260-287.00P.

Farlind, Stig Axel Goran, to STECE - AB Industrifjadrar. Buckles for safety belts. 3,945,091, Cl. 24-230.00A.

Farona, Michael F.; and White, James F., to University of Akron, The. Method for reacting organic halides. 3,946,072, Cl. 260-543.00R.

Farr, Glyn Phillip Reginald, to Girling Limited. Brake pressure control valves. 3,945,688, Cl. 303-22.00R.

Fassbinder, Hans Georg: *See*—
Brotzmann, Karl; and Fassbinder, Hans Georg, 3,945,820.

Fastaia, Anthony J.: *See*—
Hasbrouck, Larkin M.; and Fastaia, Anthony J., 3,946,305.

Fay, James P., to Vital Signs, Incorporated. Hospital communication system. 3,946,159, Cl. 179-2.0TV.

Febuary, Monty D. Apparel valise. 3,945,415, Cl. 150-7.000.

Fedders Corporation: *See*—
Kosfeld, Milton M., 3,945,220.
Osterkorn, Charles Louis; and Marino, Salvatore M., 3,945,554.

Federal Pacific Electric Company: *See*—
Meacham, James F.; and Notte, Louis R., 3,946,283.

Fedorov, Svyatoslav Nikolaevich; and Zuev, Viktor Konstantinovich. Through corneal prosthesis and method of installing same. 3,945,054, Cl. 3-13.000.

Fedorov, Valery Pavlovich: *See*—
Listov, Petr Nikolaevich; Ganiev, Madzhid Saidovich; Buromsky, Vladimir Ivanovich; Bogdanova, Lidia Ivanovna; Kalafatov, Enver Tefikovich; Topalidi, Dmitry Nikolaevich; Rodionov, Vitaly Petrovich; Junusov, Edem Idrisovich; and Fedorov, Valery Pavlovich, 3,945,179.

Feiler, Leonard; and Gelman, Sheldon F., to Stauffer Chemical Company. Method for preparing vinyl halide polymers having improved processing characteristics and polymers prepared thereby. 3,945,985, Cl. 260-92.80W.

Feld, Arnold W., to Conco Inc. Thyristor control system. 3,946,293, Cl. 318-227.000.

Feldstein, Nathan, to RCA Corporation. Method of electroless nickel plating. 3,946,126, Cl. 427-283.000.

Fennel, Patrick W.: *See*—
Moodie, Rodger H.; and Fennel, Patrick W., 3,945,611.

Fiber Controls Corporation: *See*—
Wise, Cecil S., 3,945,683.

Fiberglas Canada Limited: *See*—
Schmidt, Warren H. D., 3,945,815.

Figiel, Francis J.; Tepper, Robert J.; and Dunn, Michael L., to Allied Chemical Corporation. Novel trichloromonofluoromethane-alcohol azeotropes. 3,945,932, Cl. 252-54.000.

Fikentscher, Rolf: *See*—
Rokohl, Rudolf; Fikentscher, Rolf; and Helfert, Herbert, 3,945,794.

Filson, John Richard, to Minnesota Mining and Manufacturing Company. Snap spade electrical connector and method of manufacture. 3,945,709, Cl. 339-257.000.

Fiore, William Victor. Fluid flow measuring apparatus. 3,945,252, Cl. 73-204.000.

Firester, Arthur Herbert: *See*—
Gale, Michael Thomas; and Firester, Arthur Herbert, 3,945,825.

Firestone Tire & Rubber Company, The: *See*—
Higbee, Wallace C.; Jensen, Jay W.; and Walker, Ronald J., 3,945,586.
Willey, Ronald Albert; and Rumpf, Robert John, 3,945,587.

Firmenich SA: *See*—
Demole, Edouard P., 3,946,050.
Demole, Edouard P., 3,946,080.
Rautenstrauch, Valentin; and Naf, Ferdinand, 3,946,078.

Fischer, Adolf; and Rohr, Wolfgang, to BASF Aktiengesellschaft. 2-Oxy and 2-thio-2,3-dihydrobenzofuranyl-5-aminosulfonates. 3,946,048, Cl. 260-346.20R.

Fischer, James L.: *See*—
Kellerman, Rudolph; and Fischer, James L., 3,945,478.

Fitz, Herbert; and Mayer, Franz, to Hoechst Aktiengesellschaft. Process for connecting shaped structures containing polytetrafluoroethylene. 3,946,136, Cl. 428-422.000.

Fitzgerald, James J., to Wagner Electric Corporation. Lamp assembly and connector for same. 3,945,707, Cl. 339-128.000.

Fleckenstein, Erwin; Heinrich, Ernst; and Mohr, Reinhard, to Cassella Farbwerke Mainkur AG. 2-Hydrocarbyloxy-pyridine compounds. 3,946,024, Cl. 260-294.900.

Fleischer, Donald Whiting, to Veeder Industries, Inc. Resettable electronic counter employing a calculator chip. 3,946,210, Cl. 235-92.0SA.

Fleischer, Henry. Multiple plate valve. 3,945,605, Cl. 251-212.000.

Fleming, Robert W.: *See*—
Albrecht, William L.; and Fleming, Robert W., 3,946,021.

Flodin, Rodman C., to Phillips Screw Company. Apparatus for cold forming recesses in the heads of screw fasteners. 3,945,071, Cl. 10-7.000.

Fluid Energy Processing & Equipment Co.: *See—*
Stephanoff, Nicholas N., 3,945,130.
Fluke Trendar Corporation: *See—*
Saper, Barry M.; and Lam, Tim Yee, 3,946,310.
FMC Corporation: *See—*
Aal, Robert A.; Chen, Norman H. C.; and Chapman, James K., Jr., 3,945,891.
Wilson, Donald C., 3,945,915.
Foerster, George S.: *See—*
Easwaran, Jairaj; and Foerster, George S., 3,945,819.
Foley, Kevin M.: *See—*
Biefeld, Lawrence P.; Foley, Kevin M.; and McCombs, Frank Paul, 3,946,131.
Foley, Thomas C.: *See—*
Malpass, Dennis B.; Heilig, George Charles; and Foley, Thomas C., 3,946,058.
Foote, Lawrence R., to Ford Motor Company. Electrical control system for an exhaust gas sensor. 3,946,198. Cl. 219-497.000.
Forbes, Gordon B.; and Van Houten, Roland W., to Subsea Equipment Associates Ltd. Subsea wellhead shielding and shock mitigating system. 3,945,213, Cl. 61-69.00R.
Ford, Eric Harold, to Lumenition Limited. Fuel injection systems for internal combustion engines. 3,945,350, Cl. 123-32.0EA.
Ford Motor Company: *See—*
Foote, Lawrence R., 3,946,198.
Formica Corporation: *See—*
Power, George Edward; and Wulfekotter, Dudley, 3,946,137.
Forsstrom, Bo Gosta, to LKB-Produkter AB. Sample transportation device. 3,945,412, Cl. 141-130.000.
Forster, Friedrich; Barth, Erich; and Keller, Heinz-Jochen, to Friedrich Uhde GmbH. Method of producing an homogeneous gas mixture. 3,946,104, Cl. 423-659.000.
Foster, Peter D., to Westvaco Corporation. Decolorizing method for waste kraft paper mill effluents. 3,945,917, Cl. 210-28.000.
Foster, Ted C.: *See—*
Fritz, Rene E.; and Foster, Ted C., 3,945,299.
Foundation for Research and Engineering Education: *See—*
Reimuller, Christian J., 3,945,352.
Fournier, Daniel: *See—*
Beaty, Thomas, Jr.; and Fournier, Daniel, 3,945,105.
Foye, John J., to Kaiser Aluminum & Chemical Corporation. Mold alignment device for horizontal casting. 3,945,425, Cl. 164-137.000.
Francis, Howard T.: *See—*
Allison, Kenneth C.; Francis, Howard T.; Abele, Robert J.; and Pawlak, Kenneth E., 3,945,384.
Frank, Richard B., to G. D. Searle & Co. Liquid scintillation counting system with automatic gain correction. 3,946,231, Cl. 250-328.000.
Frank, Roger. Bar-tumbler type safety lock. 3,945,229, Cl. 70-363.000.
Frankham, David Binfield: *See—*
Davison, Michael; Frankham, David Binfield; and Spence, Thomas William Matches, 3,946,002.
Franklin, William H., Jr.: *See—*
Philips, William D.; and Franklin, William H., Jr., 3,946,337.
Fransen, Jan Josephus Bernardus: *See—*
Van Vucht, Johannes Hendrikus Nicolaas; and Fransen, Jan Josephus Bernardus, 3,945,949.
Franz, Henry H. Apparatus for capping and controlling level of fluid in flexible containers or bottles. 3,945,174, Cl. 53-289.000.
Franzen, Gustav, to Palitex Project Company GmbH. Self-threading yarn brake mechanism in a hollow spindle assembly of a textile yarn processing machine. 3,945,184, Cl. 57-58.860.
Fraser, Douglas S., to FTS Systems Inc. Valve particularly adapted for use in vacuum work. 3,945,603, Cl. 251-148.000.
Frauhammer, Karl: *See—*
Stahle, Eugen; and Frauhammer, Karl, 3,945,259.
Frechin, Jean-Paul, to Mitchell S.A. Ski binding. 3,945,658, Cl. 280-11.35K.
Freck, David Vernon, to Central Electricity Generating Board. Fuel particles having pyrolitic carbon coating for nuclear reactors and the manufacture of such fuel. 3,945,884, Cl. 176-68.000.
Fredriksen, Wilhelm. Cross-country type ski binding. 3,945,657, Cl. 280-11.35B.
French, Charles S.: *See—*
McGee, Charles D.; and French, Charles S., 3,945,044.
Frese, Stefan: *See—*
Habock, Adolf; Beckmann, Oskar; Frese, Stefan; Radda, Herbert; Mayerhofer, Franz; and Leowald, Karl-Friedrich, 3,946,389.
Frezzolini Electronics, Inc.: *See—*
Frezzolini, James; and Crawford, James J., 3,946,260.
Frezzolini, James; and Crawford, James J., to Frezzolini Electronics, Inc. Motor construction. 3,946,260, Cl. 310-112.000.
Fried, Krupp Gesellschaft mit beschrankter Haftung: *See—*
Dose, Gerhard, 3,945,514.
Friedman, Howard; Levinson, David W.; and Millman, Morris H. Method of chemical machining utilizing same coating of positive photoresist to etch and electroplate. 3,945,826, Cl. 96-36.000.
Friedrich Uhde GmbH: *See—*
Forster, Friedrich; Barth, Erich; and Keller, Heinz-Jochen, 3,946,104.
Fries, Bernard A., to Chevron Research Company. Support housing for radioisotope generation. 3,946,237, Cl. 250-432.0PD.
Fries, Bernard A., to Chevron Research Company. Shielded radioisotope generator and method for using same. 3,946,238, Cl. 250-432.0PD.
Frisbie, Milo W.; and McKinley, Milton R., to Motorola, Inc. Indexing apparatus. 3,945,505, Cl. 214-1.0BB.
Frito-Lay, Inc.: *See—*
Sellers, Kenneth W., 3,945,448.
Fritsch, Robert A.; Mayo, James C., Sr.; and Johnson, James N., to Harnischfeger Corporation. Means for storing and connecting jib for telescopic boom of mobile crane. 3,945,333, Cl. 212-144.000.
Fritsch, Robert A., to Harnischfeger Corporation. Powered outrigger beams having stabilizing spacer pad means. 3,945,666, Cl. 280-150.500.
Fritz, Rene E.; and Foster, Ted C., to Albany International Industries, Inc. Linear positioning apparatus. 3,945,299, Cl. 91-31.000.
Frohwein, George E.: *See—*
McMillian, Lonnie S.; and Frohwein, George E., 3,946,374.
Froom, Jocelyn; and Carroll, John Edward, to International Standard Electric Corporation. Microwave solid state circuit employing a bipolar transistor structure. 3,946,336, Cl. 331-107.00R.
Frost, William B. Transparent carrier sheet carrying transferable indicia and reference transferable guide marks and method of utilizing the same for sign-making. 3,945,141, Cl. 40-125.00A.
Fruehauf Corporation: *See—*
Cooper, George W., 3,945,503.
Wright, Lawrence A., 3,945,504.
FTS Systems Inc.: *See—*
Fraser, Douglas S., 3,945,603.
Fuger, Karl E.; and Burk, Emmett H., Jr., to Atlantic Richfield Company. Process for preparing certain 1,3,4-dioxazol-2-ones and products. 3,946,014, Cl. 260-268.00C.
Fuji Machinery Co., Ltd.: *See—*
Suzuki, Masahiko; Motomura, Takayuki; Seko, Kiyoshi; and Takahashi, Hiroshi, 3,945,614.
Fuji Photo Film Co., Ltd.: *See—*
Asano, Yoshio; and Ohkubo, Kinji, 3,946,411.
Iwano, Haruhiko, 3,945,828.
Sakai, Tadao; Kawai, Masayoshi; Yamamoto, Nobuo; and Yoneyama, Masakazu, 3,945,824.
Satomura, Masato, 3,945,831.
Shiba, Keisuke; Hinata, Masanao; Ohi, Reiichi; and Shishido, Tadao, 3,945,832.
Yazawa, Kenichiro; Kishimoto, Shinzo; Miyano, Shizuo; and Kondo, Asaji, 3,945,830.
Fuji Photo Optical Co., Ltd.: *See—*
Doi, Yoshikazu; Kishikawa, Toshiro; and Yamada, Hiroshi, 3,945,713.
Fuji Sashi Industries Limited: *See—*
Nikaido, Norio; Shirai, Shinji; Iihashi, Mototaka; and Umemoto, Sueo, 3,945,899.
Fujimoto, Yasuo; Tatsukawa, Keizo; Nagaoka, Koichi; Nagumo, Masayuki; and Nagai, Kiichi, to Kyowa Hakko Kogyo Co., Ltd. Novel resinous material by reaction of epoxy compounds and polyglutamic acid salts. 3,945,952, Cl. 260-2.00N.
Fujisaki, Yoshinori; and Shigeno, Shunichi, to Yoshida Kogyo Kabushiki Kaisha. Apparatus for assembling sliders with fastener stringers. 3,945,103, Cl. 29-207.5SL.
Fujisash Industries, Ltd.: *See—*
Osuga, Masanori; and Adachi, Hayao, 3,945,895.
Fukuhara, Satoru; Yamamoto, Shigehiko; and Okano, Hiroshi, to Hitachi, Ltd. Method of stabilizing emitted electron beam in field emission electron gun. 3,945,698, Cl. 316-26.000.
Fukuma, Nobuo: *See—*
Nakao, Hisaji; Fukuma, Nobuo; Matsubara, Hideyuki; Takasu, Tadahiro; and Yoneda, Takao, 3,946,212.
Fukuroi, Takeo, to Yoshida Kogyo Kabushiki Kaisha. Automatically locking slider for slide fasteners. 3,945,090, Cl. 24-205.14R.
Fukutome, Riichi, to Nihon Shinku Gijutsu Kabushiki Kaisha. Metal tool. 3,945,807, Cl. 29-182.300.
Furukawa Electric Co., Ltd.: *See—*
Tobita, Susumu; Shimoishizaka, Masashi; Sumita, Yuzo; Oishi, Isamu; and Kato, Koji, 3,945,552.
Furukawa, Kaoru; Tsukamoto, Chiaki; Nagai, Hiroshi; Matsunami, Koichi; and Nagano, Hikoichi, to Toyo Boseki Kabushiki Kaisha. Block copolymer of polyamide and polyether, and its preparation and use. 3,946,089, Cl. 260-857.0PG.
Fuse, Shigeru: *See—*
Ishii, Kiyoshi; Fuse, Shigeru; and Takashima, Masatake, 3,946,407.
Fuzikawa, Iwao: *See—*
Tsubakimoto, Tsuneo; and Fuzikawa, Iwao, 3,945,980.
G. D. Searle & Co.: *See—*
Chien, Yie W.; and Lambert, Howard J., 3,946,106.
Frank, Richard B., 3,946,231.
G & H Technology, Inc.: *See—*
McCormick, Larry L., 3,945,703.
G. Schwartz & Co.: *See—*
Zodrow, Bernhard; Kovacev, Milan; Stengritt, Wolf Dietrich; and Hopp, Rudolf, 3,945,466.
Gabbard, Ova Gene: *See—*
Husted, John M.; Gabbard, Ova Gene; and Schmidt, William G., 3,946,161.
Gacs, Istvan: *See—*
Mlinko, Sandor; Banfi, Dezso; Gacs, Istvan; Payer, Karoly; Otvos, Laszlo; Vargay, Zoltan; Dobis nee Farkas, Emilia; and Palagyi, Tivadar, 3,945,797.
Gadient, Fulvio, to Sandoz Ltd. 6,11-Dihydro-11-oxodibenzo[b,e]thiepine-2-acetic acids. 3,946,036, Cl. 260-327.00B.
Gaetano, Camille M. Multiple compartment thermally insulated container. 3,945,496, Cl. 206-546.000.
Gagneux, Andre: *See—*
Allgeier, Hans; and Gagneux, Andre, 3,946,032.
Gagnon, Kenneth M. Securing device. 3,945,089, Cl. 24-155.0SD.

Gale, Michael Thomas; and Firester, Arthur Herbert, to RCA Corporation. Method for producing width-modulated surface relief patterns. 3,945,825, Cl. 96-27.00H.

Gallagher, James G. Mounting system for infrared tubes. 3,946,353, Cl. 338-318.000.

Galvin, Aaron A., to American District Telegraph Company. Multiple zone intrusion alarm system. 3,946,376, Cl. 340-258.00R.

Gandini, Sergio. Orientable lighting fixture. 3,946,221, Cl. 240-128.000.

Ganiev, Madzhid Saidovich: *See—*
Listov, Petr Nikolaevich; Ganiev, Madzhid Saidovich; Buromsky, Vladimir Ivanovich; Bogdanova, Lidia Ivanovna; Kalafatov, Enver Tefikovich; Topalidi, Dmitry Nikolaevich; Rodionov, Vitaly Petrovich; Junusov, Edem Idrisovich; and Fedorov, Valery Pavlovich, 3,945,179.

Gantert, Manfred, to BASF Aktiengesellschaft. Synchronized demodulation of the chrominance signal with switched carrier phase angles. 3,946,431, Cl. 358-9.000.

Gantsweg, Marvin: *See—*
Smith, Valor C.; Gantsweg, Marvin; and Faigen, Ivan M., 3,946,396.

Garcia, Jose Juan, to Industrias Rumbo, S.A. Remote control programming system. 3,946,314, Cl. 325-51.000.

Gardner, Kent A. Collapsible sauna bath kit. 3,945,058, Cl. 4-163.000.

Gargione, Frank V., to Climalene Company, The. Liquid dispensing bottle-hanger construction. 3,945,060, Cl. 4-228.000.

Garner, Joseph L., to Dow Chemical Company, The. Polymerization of styrene acrylonitrile expandable microspheres. 3,945,956, Cl. 260-2.50B.

Garrett Corporation, The: *See—*
Parker, Kenneth O.; and Marksberry, Clarence L., 3,945,434.

Gartland, Albert J., Jr., to Harvey Hubbell, Incorporated. Contact spring. 3,945,710, Cl. 339-258.00R.

Gasbarro, Geno N. Apparatus for pre-heating poultry prior to cooking. 3,945,311, Cl. 99-483.000.

Gasparaitis, Bernard: *See—*
Alexander, Norman P.; and Gasparaitis, Bernard, 3,946,390.

Gassman, Gerhard-Gunter, to International Standard Electric Corporation. System for transferring wideband sound signals. 3,946,162, Cl. 179-15.55R.

Gaudilliere, Jean-Louis; and Dahan, Gilbert, to Aluminum Pechiney. Device for cooling metal wire. 3,945,623, Cl. 266-3.00R.

GCA Corporation: *See—*
Juodikis, Peter, 3,946,200.
Juodikis, Peter, 3,946,252.

Gebhardt, Fritz, to Karl M. Reich Maschinenfabrik GmbH. Apparatus for sawing a panel into portions. 3,945,285, Cl. 83-437.000.

Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H.: *See—*
Henrich, Friedhelm; and Lanfermann, Willy, 3,945,680.

Gebruder Junghans GmbH: *See—*
Wolber, Robert, 3,945,192.

Gelanyi, Istvan: *See—*
Enody, Emil; Kovacs, Sandor; Gelanyi, Istvan; Karoly, Bela; and Kacsmarek, Bela, 3,945,072.

Gelman, Sheldon F.: *See—*
Feiler, Leonard; and Gelman, Sheldon F., 3,945,985.

Gelon, Robert, to Rheinische Chamotte - und Dinas Werke. Radial piston machine. 3,945,766, Cl. 417-273.000.

General Atomic Company: *See—*
Graham, Weldon Charles, 3,946,191.
Ragone, David V.; and Simnad, Massoud T., 3,945,629.

General Cable Corporation: *See—*
Dover, Thomas J.; and Thompson, Walter F., 3,945,182.

General Dynamics Corporation: *See—*
Bjerede, Bjorn E., 3,946,323.
Eisenmann, James R.; Kaminski, Ben E.; and Waddoups, Max E., Jr., 3,946,127.

General Electric Company: *See—*
Adams, Theodore P., 3,945,387.
Berkowitz, Ami E., 3,945,343.
Berkowitz, Ami E.; and Lahut, Joseph A., 3,946,404.
Bobo, Melvin, 3,945,759.
Jaquiss, Donald B. G., 3,945,967.
MacKenzie, Burton Thornley, Jr., 3,946,099.
Roussin, Alfred G., 3,946,154.
Sigsbee, Raymond A.; and Barber, William D., 3,946,418.

General Motors Corporation: *See—*
Daniels, Elon, Jr.; and Kline, Richard H., 3,945,097.
Louzecky, Paul J., 3,945,775.
Neuman, John G.; and Johnston, Richard W., 3,945,362.

Genio Tools, Inc.: *See—*
Bennett, Gene Lee, 3,945,752.

Gentile, Scipio S. Torque transmitting apparatus. 3,945,755, Cl. 415-5.000.

Georgi, Donald K., to Graco Inc. Fluid motor drives pump having an active inlet valve. 3,945,768, Cl. 417-317.000.

Gerber, Jurgen: *See—*
Heusler, Helmut; Alpers, Gunther; and Gerber, Jurgen, 3,945,138.

Gerlach, John R., to Emhart Corporation. Seal lock and the like incorporating permanently secured single engagement. 3,945,671, Cl. 292-323.000.

Gershanov, Felix Borisovich; Liakumovich, Alexandr Grigorievich; Michurov, Jury Ivanovich; Pantukh, Boris Izrailevich; Rutman, Grigory Iosifovich; Sobolev, Valerian Mikhailovich; Grinberg, Alexandr Afroimovich; Gurvich, Yakov Abramovich; Zakharova, Nina Vasilievna; and Nafikova, Almira Mudarisovna. Method of producing 2,6-dialkyl- and 2,6-diaralkyl-substituted derivatives of p-cresol. 3,946,086, Cl. 260-624.00R.

Ghirga, Marcello: *See—*
Calcagno, Benedetto; Divo, Claudio; and Ghirga, Marcello, 3,946,068.

Giacopelli, Umberto, to Solvay & Cie. Bipolar electrodes and electrolytic cell therewith. 3,945,909, Cl. 204-284.000.

Gibson, Andrew; and Turner, Trevor John, to Imperial Chemical Industries Limited. Water-resistant fuse-cord. 3,945,320, Cl. 102-27.00R.

Giese, Erik O. Heated inner sole and battery case for use in boot construction. 3,946,193, Cl. 219-211.000.

Gioia, Norman Frank: *See—*
Altmann, Bert Lane; Gregg, Robert Milton; and Gioia, Norman Frank, 3,946,438.

Girling Limited: *See—*
Allen, Brian Robert; and Harrison, Anthony William, 3,946,192.
Farr, Glyn Phillip Reginald, 3,945,688.
Wright, Andrew Charles Walden, 3,945,261.

Girnus, Ronald Carl, Sr. Anti-theft vehicle shelter. 3,945,159, Cl. 52-66.000.

Gist-Brocades N.V.: *See—*
Bruynes, Cornelis Adrianus; and van der Drift, Johannes Karel, 3,945,994.

Givens, Travis R., to Reynolds Metals Company. Anode lining system. 3,945,906, Cl. 204-245.000.

Givins, John S., Jr.: *See—*
Brobeck, William M.; Givins, John S., Jr.; Meads, Philip F., Jr.; and Thomas, Robert E., 3,946,220.

Glass Containers Corporation: *See—*
Cooper, Darryl B., 3,945,486.

Glaswerk Schuller GmbH: *See—*
Keib, Heinz; and Kahnke, Dieter, 3,945,814.

Globe Tool and Engineering Company, The: *See—*
Hopkins, Charles L., 3,946,287.

Glockner, Hans: *See—*
Zorn, Hugo; Kuffner, Karl; Glockner, Hans; Willems, Jozef Frans; and Thiers, Robrecht Julius, 3,945,829.

Goddard, Robert M. Split cross fader for the control of theatre lighting. 3,946,273, Cl. 315-297.000.

Goel, Om P., to Parke, Davis & Company. Process for the preparation of acid chlorides. 3,946,015, Cl. 260-268.00H.

Goff, Randall; and Delvecchio, Leonard P., to Dresser Industries, Inc. Differential pressure switch. 3,946,176, Cl. 200-83.00J.

Goff, Yves le: *See—*
Farge, Daniel; Goff, Yves le; Messer, Mayer Naoum; and Poiget, Gilbert, 3,946,019.

Gokhale, Sudarshan D., to BASF Wyandotte Corporation. Electrolytic cell having rhenium coated cathodes. 3,945,907, Cl. 204-266.000.

Golant, Jury Khonanovich: *See—*
Yascheritsyn, Petr Ivanovich; Golant, Jury Khonanovich; Leushkin, Vadim Nikolaevich; Mironov, Gennady Mikhailovich; Minakov, Anatoly Petrovich; and Bogachev, Viktor Vladimirovich, 3,945,098.

Goldberg, Abraham A.; and Rossi, John P., to CBS Inc. Apparatus for digitally encoding a television signal. 3,946,432, Cl. 358-13.000.

Goldetsky, Norman: *See—*
Greenberg, Percy, 3,945,497.

Goldsmith, Norman; and Robinson, Paul Harvey, to RCA Corporation. Method of growing thick expitaxial layers of silicon. 3,945,864, Cl. 148-175.000.

Goletto, Jean, to Rhone-Poulenc Textile. Heat-resistant polyurethane compositions. 3,945,968, Cl. 260-45.95R.

Gollinger, Wolfgang, to ITT Industries, Inc. Electronic quartz clock with integrated circuits. 3,945,194, Cl. 58-23.00R.

Gomory, Paul L., to Phillips Petroleum Company. Securing a filamentous extrudate into a base material matrix at least one of which is expandable. 3,946,096, Cl. 264-46.100.

Goodyear Tire & Rubber Company, The: *See—*
Jackson, William E., 3,945,875.
Ofstead, Eilert A., 3,945,986.
Rudder, Walter H.; Braden, William D., deceased; McEvoy, Charles J.; Dodson, Stokes R., Jr.; Thiele, John R.; and Livgren, Allen L., 3,945,866.
Spoerke, Roger W., 3,945,970.

Goralski, Christian T.; and Klingler, Thomas C., to Dow Chemical Company, The. 1-(arylthio, arylsulfinyl and arylsulfonyl)-1,1-dihalomethanesulfonamides. 3,946,007, Cl. 260-247.10R.

Gordon, David A.; and Seltzer, Raymond, to Ciba-Geigy Corporation. s-Triazine tetracarboxylic acids and dianhydrides. 3,946,011, Cl. 260-249.600.

Gordon, Dean R. Apparatus for deflecting a nail into an arcuate path. 3,945,414, Cl. 145-46.000.

Goring, Joachim: *See—*
Tauscher, Manfred; Goring, Joachim; Busch, Wolfgang; and Rohte, Oskar, 3,946,013.

Gorini, Robert F.: *See—*
Babson, Edward S.; and Gorini, Robert F., 3,945,074.

Gorter, Werner; Kresta, Erich; and Stumpf, Horst, to Semperit AG. Molded article formed of fiber reinforced material. 3,945,420, Cl. 152-357.00A.

Goto, Katsuichi. Coil assembly for bobbin wound transformer. 3,946,350, Cl. 336-208.000.

Gott, Hans: *See—*
Scherr, Rudolf; Jamnig, Walter; Gott, Hans; and Ritter, Klaus, 3,945,409.

Gould, Gordon E.: *See—*
Carmody, William D.; Park, William Robb Roy; and Gould, Gordon E., 3,945,495.

Gould, Inc.: *See—*
Christianson, Clinton C.; and Bourke, Robert F., 3,946,299.

Gourmandy, Raymond: *See—*
Vidal, Roger; and Gourmandy, Raymond, 3,946,133.

Graco Inc.: *See—*
Georgi, Donald K., 3,945,768.
Otto, Mark O., 3,945,533.

Grafton, David, to Xerox Corporation. Optical scanner. 3,946,150, Cl. 178-6.70R.

Graham, James R., Jr., to Container Corporation of America. Partition divider. 3,945,557, Cl. 229-15.000.

Graham, Weldon Charles, to General Atomic Company. Welding apparatus. 3,946,191, Cl. 219-125.00R.

Granillo, Gilbert R., Jr.: *See—*
Banks, Michael H.; and Granillo, Gilbert R., Jr., 3,945,655.

Graser, Michael, Jr., to Technical Operations, Incorporated. Color control system for optical image apparatus. 3,945,731, Cl. 356-178.000.

Grassi, Bruno: *See—*
De Ceuster, Jean; and Grassi, Bruno, 3,945,910.

Gray, Bernard Herbert Leslie: *See—*
McBride, Maurice Graham; and Gray, Bernard Herbert Leslie, 3,946,259.

Gray, Richard W., to USM Corporation. Machine for assembling flexible workpieces. 3,945,632, Cl. 270-52.000.

Green Cross Corporation, The: *See—*
Mima, Yasuhiro; and Yamada, Masaaki, 3,945,889.

Green, Percy, to Johnson & Johnson. Cast-forming composition. 3,945,842, Cl. 106-111.000.

Greenberg, Percy, to Goldetsky, Norman, a part interest. Storage appliance. 3,945,497, Cl. 211-60.00R.

Greene, Leonard M., to Safe Flight Instrument Corporation. Fixed beam radar with range light display. 3,946,394, Cl. 343-13.00R.

Greenwood, Roger, to International Telephone & Telegraph Corporation. Combination valve. 3,945,401, Cl. 137-627.500.

Greeson, Richard L.; and Philofsky, Elliott M., to Motorola, Inc. Metallization system for semiconductor devices, devices utilizing such metallization system and method for making devices and metallization system. 3,945,111, Cl. 29-588.000.

Gregg, Robert Milton: *See—*
Altmann, Bert Lane; Gregg, Robert Milton; and Gioia, Norman Frank, 3,946,438.

Greven, Johann: *See—*
Wetzels, Walter; and Greven, Johann, 3,945,284.

Grier, William R.: *See—*
Gubelmann, William S., deceased; Gubelmann, Walter S., executor; and Grier, William R., 3,945,480.

Griffin, Charles De Witt, to Du Pont de Nemours, E. I., and Company. Drive for feed rolls. 3,945,262, Cl. 74-219.000.

Griffin, Richard H., to International Telephone and Telegraph Corporation. Electrical connector with premold. 3,945,708, Cl. 339-189.00R.

Grigoleit Company, The: *See—*
Howie, Robert K., Jr., 3,946,186.

Grimes Manufacturing Company: *See—*
Stepp, Gregory; and Patrick, Michael Dennis, Sr., 3,946,271.

Grinberg, Alexandr Afroimovich: *See—*
Gershanov, Felix Borisovich; Liakumovich, Alexandr Grigorievich; Michurov, Jury Ivanovich; Pantukh, Boris Izrailevich; Rutman, Grigory Iosifovich; Sobolev, Valerian Mikhailovich; Zakharova, Nina Vasilievna; and Nafikova, Almira Mudarisovna, 3,946,086.

Griswold, James D. Hanger brackets. 3,945,462, Cl. 182-150.000.

Grosser, Christian E.; and Roehm, Jack M., to Grosser Enclosures Company. Building structures. 3,945,160, Cl. 52-81.000.

Grosser Enclosures Company: *See—*
Grosser, Christian E.; and Roehm, Jack M., 3,945,160.

Gruber, Alan Herbert, to International Telephone & Telegraph Corporation. Automatic level control circuit for local oscillator signals with the lever control signal being derived from the DC current present in the diode circuit of an MIC frequency mixer. 3,946,318, Cl. 325-411.000.

Gruenewald, Tzvi: *See—*
Leavitt, Chaim; Alper, Yekutiel; and Gruenewald, Tzvi, 3,945,330.

Gruffaz, Max; and Rollet, Bernard, to Rhone-Poulenc, S.A. Process for preparing solid bis-(4-furfurylidenamino-phenyl)-methane. 3,945,999, Cl. 260-240.00G.

Grumman Aerospace Corporation: *See—*
Leftheris, Basil P., 3,945,109.

Gruner, George, to Intersil, Inc. Spring wire contact assembly. 3,946,185, Cl. 200-245.000.

Gryctko, Carl E.; and Robins, Charles T., to I-T-E Imperial Corporation. Narrow multi-pole circuit breaker having inertia actuated overtravel for latch release. 3,946,345, Cl. 335-9.000.

GTE Automatic Electric Laboratories Incorporated: *See—*
Beeman, Robert H., 3,946,164.
Brown, Wallace G.; and Lloyd, Thomas C., 3,946,146.
Marheine, Edward A., 3,946,291.

GTE Laboratories Incorporated: *See—*
Moolenbeek, Rob; and Norlund, Bent, 3,946,373.

GTE Sylvania Incorporated: *See—*
Armstrong, Donald E., 3,945,697.
Keeffe, William M.; and Koury, Frederic, 3,946,262.

Gubelmann, Walter S., executor: *See—*
Gubelmann, William S., deceased; Gubelmann, Walter S., executor; and Grier, William R., 3,945,480.

Gubelmann, William S., deceased; by Gubelmann, Walter S., executor; and Grier, William R., to Realty & Industrial Corporation. Justifying, text writing reproducing machine. 3,945,480, Cl. 197-84.00A.

Guichard, Jacques M.: *See—*
Leclercq, Marc A.; Poirier, Alain M.; and Guichard, Jacques M., 3,946,158.

Gurvich, Yakov Abramovich: *See—*
Gershanov, Felix Borisovich; Liakumovich, Alexandr Grigorievich; Michurov, Jury Ivanovich; Pantukh, Boris Izrailevich; Rutman, Grigory Iosifovich; Sobolev, Valerian Mikhailovich; Grinberg, Alexandr Afroimovich; Gurvich, Yakov Abramovich; Zakharova, Nina Vasilievna; and Nafikova, Almira Mudarisovna, 3,946,086.

Gyorgy, Lajos: *See—*
Deak, Gyula; Doda, Margit; Gyorgy, Lajos; Hazai, Laszlo; and Pfeifer, Klara, deceased, 3,946,018.

H. Maihak AG: *See—*
Bisgaard, Hans Flinker; and Klemar, Benny Aaris, 3,945,255.

Haag, Walter, to Barrel Fresh Service AG. Sealing closure for containers. 3,945,529, Cl. 220-307.000.

Haber, Terry M. Acceleration/deceleration actuating mechanism for wrist instruments. 3,946,173, Cl. 200-52.00R.

Habermeier, Jurgen: *See—*
Porret, Daniel; and Habermeier, Jurgen, 3,946,034.

Habock, Adolf; Beckmann, Oskar; Frese, Stefan; Radda, Herbert; Mayerhofer, Franz; and Leowald, Karl-Friedrich, to Siemens Aktiengesellschaft. Circuit arrangement for the wireless transmission of control signals to the control paths of controlled semiconductor valves. 3,946,389, Cl. 343-225.000.

Haca Pty. Ltd.: *See—*
Kepper, George John, 3,946,213.

Hachiya, Takeo: *See—*
Hagiya, Keiichi; Maki, Mamoru; Ogawa, Hiroshi; Hachiya, Takeo; and Ochiai, Kiyozo, 3,945,754.

Hacskaylo, Michael, to United States of America, Army. Low impedance diode mounting structure and housing. 3,946,416, Cl. 357-17.000.

Hadano, Takushige: *See—*
Ikeda, Takuo; Hadano, Takushige; and Nogi, Syunsuke, 3,945,990.

Hagemeister, Klaus: *See—*
Rossmann, Axel; and Hagemeister, Klaus, 3,945,101.

Hagiya, Keiichi; Maki, Mamoru; Ogawa, Hiroshi; Hachiya, Takeo; and Ochiai, Kiyozo, to Hitachi, Ltd. Hydraulic machines and operating method thereof. 3,945,754, Cl. 415-1.000.

Hahn, Guenter; Lampe, Hans Hermann; and Rudolph, Peter, to International Business Machines Corporation. Dynamic digital pulse display. 3,946,378, Cl. 340-324.00M.

Hahn, Gunter: *See—*
Boehme, Dietrich; Hahn, Gunter; Schumann, Gunter; Wienen, Walter; and Jung, Rolf, 3,945,279.

Hahn, Werner; Scholze, Herbert; and Seifert, Rolf, to Veb Pentacon Dresden. Photographic camera having electric motor drive for shutter cocking and film winding. 3,946,412, Cl. 354-204.000.

Hajdu, Laszlo: *See—*
Mote, Harold Trevor; Hajdu, Laszlo; and Ronay, Bela, 3,945,851.

Hakozaki, Hiroshi, to Mitsui Shipbuilding & Engineering Co., Ltd. Variable time axis controller in simulation computer. 3,946,363, Cl. 340-172.500.

Haldeman, Charles W., III, to United States of America, Air Force. High-power, low-loss high-frequency electrical coil. 3,946,349, Cl. 336-62.000.

Hall, Allen S., Jr.: *See—*
Hillberry, Benny M.; and Hall, Allen S., Jr., 3,945,053.

Hall, John S.: *See—*
Butts, Ernest O.; and Hall, John S., 3,945,168.

Halligan, Dewey D. Apparatus for forming and trimming the leads of electronic components. 3,945,408, Cl. 140-105.000.

Halwes, Dennis R., to Textron Inc. Nodal beam inertial flexure. 3,945,628, Cl. 267-152.000.

Hamada, Mitsuharu; and Uchiyama, Hiromichi, to Nissan Motor Company Limited. Steering linkage in wheeled vehicle for steering the vehicle along guide rails. 3,945,455, Cl. 180-79.000.

Hambro Structural Systems Limited: *See—*
Butts, Ernest O.; and Hall, John S., 3,945,168.

Hamilton, Thomas N.: *See—*
Mee, Jack E.; Heinz, David M.; Hamilton, Thomas N.; Besser, Paul J.; and Pulliam, George R., 3,946,124.

Hamm, Wilfried. Inflatable building construction. 3,945,156, Cl. 52-2.000.

Hammond, James L., to Athletic Swing Measurement, Inc. Athletic swing measurement system and method. 3,945,646, Cl. 273-186.00A.

Hamner, William F., to Monsanto Company. Broom assembly. 3,945,080, Cl. 15-187.000.

Hanai, Kiyoshi: *See—*
Tsutsumi, Masanobu; and Hanai, Kiyoshi, 3,945,665.

Hanna, Keith L., to Star-Kist Foods, Inc. Canned pet food. 3,946,123, Cl. 426-643.000.

Hannig, Christoph, to Mahle GmbH. Method for the manufacture of a compound casting. 3,945,423, Cl. 164-75.000.

Hans Herold Maschinenfabrik: *See—*
Herold, Hans; and Klahre, Manfred, 3,945,095.

Hanselmann, Dieter: *See—*
Eberle, Dieter; Hanselmann, Dieter; and Prohaska, Hans, 3,946,178.

Hanson, Alden B.; and Hanson, Chris A., to Hanson Industries Inc. Ski boot. 3,945,135, Cl. 36-2.5AL.

Hanson, Chris A.: *See—*
Hanson, Alden B.; and Hanson, Chris A., 3,945,135.

Hanson Industries Inc.: *See—*
Hanson, Alden B.; and Hanson, Chris A., 3,945,135.

Hara, Shigeyoshi: *See—*
Iwata, Kaoru; and Hara, Shigeyoshi, 3,946,033.

Harada, Nozomu; and Iwasawa, Mineo, to Tokyo Shibaura Electric Co., Ltd. Charge transfer device having control means for its photoelectric conversion characteristics. 3,946,223, Cl. 250-211.00J.

Hardin, John Ralph, Jr. Rotary shear with improved cutting assembly. 3,945,116, Cl. 30-206.000.

Harendza-Harinxma, Alfred J., to Harendza-Harinxma, Alfred J.; Catanese, Peter J.; LaPaglia, Samuel A.; and Merry, Deane W., part interest to each. Filtering material. 3,946,101, Cl. 423-210.000.

Harman, Frederick George, to British Mathews Limited, The. Apparatus for transferring discrete loads to or from pallets. 3,945,520, Cl. 214-310.000.

Harmer, Alan Lewis, to English Electric Valve Company Limited. Pyroelectric camera tubes. 3,946,232, Cl. 250-333.000.

Harnischfeger Corporation: *See—*
Fritsch, Robert A.; Mayo, James C., Sr.; and Johnson, James N., 3,945,333.
Fritsch, Robert A., 3,945,666.

Harrelson, Albert A., Jr., to Harrelson Rubber Company. Lugged vehicle tire, and method of building same. 3,945,417, Cl. 152-209.00B.

Harrelson, Glen R.; and Sherman, Earle C., to Olinkraft, Inc. Package lock. 3,945,560, Cl. 229-40.000.

Harrelson Rubber Company: *See—*
Harrelson, Albert A., Jr., 3,945,417.

Harris, Allan E.; and Harris, George M., to Harris-Hub Company, Inc. Adjustable bed frame construction. 3,945,064, Cl. 5-181.000.

Harris, Colin Frank, to Metallurgical Processes Ltd.; and I.S.C. Smelting Limited (Metallurgical Development Company). Preparation of feed material for a blast furnace. 3,946,098, Cl. 264-117.000.

Harris Corporation: *See—*
Cook, Koy B., Jr., 3,946,415.
Dufour, Charles H.; and Hercock, Robert D., 3,945,266.
Sanders, Thomas J., 3,946,426.

Harris, George M.: *See—*
Harris, Allan E.; and Harris, George M., 3,945,064.

Harris-Hub Company, Inc.: *See—*
Harris, Allan E.; and Harris, George M., 3,945,064.

Harris-Intertype Corporation: *See—*
Drake, Marvin D., 3,945,715.
Knopp, Arthur Albert, 3,945,633.

Harris, Willie. Bicycle distance safety device. 3,945,336, Cl. 116-28.00R.

Harrison, Anthony William: *See—*
Allen, Brian Robert; and Harrison, Anthony William, 3,946,192.

Harrison, James S.: *See—*
Wertlake, Paul T.; and Harrison, James S., 3,945,523.

Harrison, Michael: *See—*
Tomlinson, Kenneth; and Harrison, Michael, 3,946,108.

Harrison, Tony; and Weatherhead, Roger G., to Shell Oil Company. Phenyl urea epoxy resin accelerator. 3,945,971, Cl. 260-47.0EN.

Harsco Corporation: *See—*
Doubleday, Max; and Demarest, Douglas M., 3,945,602.

Harshaw Chemical Company, The: *See—*
Sherman, Caryl M., 3,946,134.

Harthan, Lewis John, III: *See—*
Sullivan, Arthur Francis; Brockett, Frank Howard, III; and Harthan, Lewis John, III, 3,945,394.

Hartmann, Clinton S., to Texas Instruments Incorporated. Weighting surface wave filters by withdrawing electrodes. 3,946,342, Cl. 333-72.000.

Hartsell, Glenn A., to Texas Instruments Incorporated. Two level electrode configuration for three phase charge coupled device. 3,946,420, Cl. 357-24.000.

Hartsell, Glenn A.; and Kmetz, Allan R., to Texas Instruments Incorporated. Multi phase double level metal charge coupled device. 3,946,421, Cl. 357-24.000.

Hartvig, Per: *See—*
Vessman, Jorgen; Svahn, Carl Magnus; and Hartvig, Per, 3,946,063.

Harvey Hubbell, Incorporated: *See—*
Gartland, Albert J., Jr., 3,945,710.

Hasbrouck, Larkin M.; and Fastaia, Anthony J., to United Technologies Corporation. Ignition coil and capacitor analyzer utilizing the zero cross-overs and peak voltage of the low coil ringing voltage. 3,946,305, Cl. 324-16.00R.

Hasbrouck, Larkin M., to United Technologies Corporation. Ignition coil and capacitor analyzer utilizing the zero cross overs and peak voltage of the low coil ringing voltage. 3,946,306, Cl. 324-16.00R.

Hascoe, Norman, to Semi-Alloys Incorporated. Method of fabricating a sealing cover for an hermetically sealed container. 3,946,190, Cl. 219-91.000.

Hasegawa, Hirozo: *See—*
Sakata, Hiroshi; Okamoto, Takashi; and Hasegawa, Hirozo, 3,946,091.

Hastings, Garth Winton; and Wyatt, Wade Arthur. Aqueous epoxy emulsions. 3,945,964, Cl. 260-29.6NR.

Haupt, Eberhard: *See—*
Altmann, Dieter; and Haupt, Eberhard, 3,945,088.

Hauser, Anthony J.: *See—*
Berry, James M.; Hauser, Anthony J.; and Swanson, Carl D., 3,946,405.

Hauser, Frank William, to Avia Instrument Company. Wire thread cast insert. 3,945,070, Cl. 10-1.00A.

Hautala, Earl: *See—*
Weaver, Merle L.; Hautala, Earl; and Nonaka, Masahide, 3,946,116.

Hawrylo, Frank Zygmunt; and Kressel, Henry, to RCA Corporation. Metallized device and method of fabrication. 3,945,902, Cl. 204-192.000.

Hayashi, Yutaka: *See—*
Tarui, Yasuo; and Hayashi, Yutaka, 3,946,424.

Haynes, James N., to Hercules Incorporated. Azidoformates and their use. 3,946,051, Cl. 260-349.000.

Haynie, Cyrus C.: *See—*
United States of America, National Aeronautics and Space Administration; Haynie, Cyrus C.; and Messineo, Samuel V., 3,945,879.

Hazai, Laszlo: *See—*
Deak, Gyula; Doda, Margit; Gyorgy, Lajos; Hazai, Laszlo; and Pfeifer, Klara, deceased, 3,946,018.

Heatshield Research and Development Pty., Ltd.: *See—*
Menzies, John Ian, 3,945,868.

Hecht, Richard M.; and Wiegman, William B., to Recognition Equipment Incorporated. Optical reader fluorescence control. 3,946,203, Cl. 235-61.11E.

Hedden, Jerry C., to PPG Industries, Inc. Tire cord containing glass fibers sized with a starch based size. 3,946,132, Cl. 428-378.000.

Heightshoe, Lawrence H. Game dressing board. 3,945,083, Cl. 17-44.200.

Heil, Charles Wayne, deceased: *See—*
Cook, Virgil W.; Spates, Charles D.; Heil, Charles Wayne, deceased; Heil, Terry W., executor; and Diers, executrix by Kay A., 3,945,081.

Heil, Terry W., executor: *See—*
Cook, Virgil W.; Spates, Charles D.; Heil, Charles Wayne, deceased; Heil, Terry W., executor; and Diers, executrix by Kay A., 3,945,081.

Heilig, George Charles: *See—*
Malpass, Dennis B.; Heilig, George Charles; and Foley, Thomas C., 3,946,058.

Heinrich, Ernst: *See—*
Fleckenstein, Erwin; Heinrich, Ernst; and Mohr, Reinhard, 3,946,024.

Heinz, David M.: *See—*
Mee, Jack E.; Heinz, David M.; Hamilton, Thomas N.; Besser, Paul J.; and Pulliam, George R., 3,946,124.

Helfert, Herbert: *See—*
Rokohl, Rudolf; Fikentscher, Rolf; and Helfert, Herbert, 3,945,794.

Helgemeir, Heinrich. Rail head re-form grinding machine. 3,945,152, Cl. 51-178.000.

Hell, August: *See—*
Weber, Klaus; and Hell, August, 3,945,494.

Heller, Karl Heinz: *See—*
Thiel, Reinhard; Rosenbaum, Heinz Jorg; and Heller, Karl Heinz, 3,946,077.

Heller, William C., Jr.; and Leatherman, Alfred F., to Heller, William C., Jr. Plastic hose making method. 3,945,867, Cl. 156-143.000.

Helmuth, James G.: *See—*
Wilson, William F.; Chadwick, James R.; and Helmuth, James G., 3,945,256.

Hempell, Stephen W.; and Mentz, Ben J., to Hooker Chemicals & Plastics Corporation. Liquid seal for chlorine headers. 3,945,908, Cl. 204-278.000.

Henderson, Henning Morgan. Motor vehicle safety and/or warning devices. 3,946,359, Cl. 340-52.00H.

Hendrickson, Philip J.; and Resch, Richard J., to Krueger Metal Products, Inc. Hinge lock mechanism for folding table leg. 3,945,328, Cl. 108-132.000.

Hengesbach, Robert W. Rapid seating check valve. 3,945,396, Cl. 137-496.000.

Henkel & Cie GmbH: *See—*
Conrad, Jens; Eckert, Hans Werner; Saygin, Ferdi; and Schnegelberger, Harald, 3,945,996.

Hennells, Ransom J., to Compactor Company, Inc. Waste compactor with clamshell bag support. 3,945,314, Cl. 100-53.000.

Hennemann, Lothar Roland: *See—*
Boeke, Uwe; Hennemann, Lothar Roland; Hohorst, Wolfgang; and Urban, Horst, 3,945,701.

Henrich, Friedhelm; and Lanfermann, Willy, to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H. Drum coal cutting machine having a roller crusher. 3,945,680, Cl. 299-43.000.

Henricot, Paul E., to Societe Anonyme Usines Emile Henricot. Suspension device for side members on axle-boxes for railway carriages or similar appliances. 3,945,327, Cl. 105-224.100.

Henry, Rodney D.; Besser, Paul J.; and Warren, Robert G., to Rockwell International Corporation. Characteristic temperature-derived hard bubble suppression. 3,946,372, Cl. 340-174.0TF.

Henthorn, Warren D., Jr. Arrow. 3,945,642, Cl. 273-106.50R.

Herbenar, Edward J., to TRW Inc. Pivot joint. 3,945,737, Cl. 403-27.000.

Herbst, John A. Positive and negative pressure breath control device. 3,946,174, Cl. 200-81.400.

Hercock, Robert D.: *See—*
Dufour, Charles H.; and Hercock, Robert D., 3,945,266.

Hercules Incorporated: *See—*
Haynes, James N., 3,946,051.

Hernandez, Antonio Ovando: *See—*
Daran, Jose Luis Davila; Sanchez, Mario C. Zamorano; and Hernandez, Antonio Ovando, 3,945,094.

Herold, Hans; and Klahre, Manfred, to Hans Herold Maschinenfabrik. Method and apparatus for aligning a stack of sheets. 3,945,095, Cl. 271-210.000.

Hestermans, Pierre: *See—*
Delaunois, Yvon; Hestermans, Pierre; Leroy, Georges; Peerts, Fernand; and Wilante, Claude, 3,946,083.

Hetrick, George L., to White-Westinghouse Corporation. Temperature limiting wattage control for a ceramic cooking platform. 3,946,201, Cl. 219-511.000.

Heusler, Helmut; Alpers, Gunther; and Gerber, Jurgen, to Orenstein & Koppel Aktiengesellschaft. Hydraulically controlled and driven bucket wheel dredge. 3,945,138, Cl. 37-190.000.

Hewlett-Packard Company: *See—*
Jekat, Hans, 3,946,209.
Kovalick, Albert W.; and Scholz, Kenneth D., 3,946,302.
Rode, France; Crowley, William L., Jr.; Walker, Alexander D. R.; and Cochran, David S., 3,946,218.

Higbee, Wallace C.; Jensen, Jay W.; and Walker, Ronald J., to Firestone Tire & Rubber Company, The. Interposer retractor construction. 3,945,586, Cl. 242-107.40D.

Hight, Roland W.: *See—*
Levine, Morris; Yurcheshen, Michael; and Hight, Roland W., 3,945,963.

Hill, Bernhard: *See—*
Schmidt, Klaus Peter; and Hill, Bernhard, 3,946,370.

Hill, Harold J.: *See—*
Chiu, Ying-Chech; and Hill, Harold J., 3,945,437.

Hill, William H., to Peter, Strong Research and Development Company, Inc. Medicinal compositions and methods of preparing the same. 3,946,110, Cl. 424-230.000.

Hillberry, Benny M.; and Hall, Allen S., Jr., to Purdue Research Foundation. Rolling contact prosthetic knee joint. 3,945,053, Cl. 3-1.911.

Hillion, Gerard; and Lassau, Christian, to Institut Francais du Petrole des Carburants et Lubrifiants. New process for hydrogenating ketones. 3,946,087, Cl. 260-631.00H.

Hinata, Masanao: *See—*
Shiba, Keisuke; Hinata, Masanao; Ohi, Reiichi; and Shishido, Tadao, 3,945,832.

Hind, John Richard; and Durston, John Graham, to United Kingdom Atomic Energy Authority. Liquid metal cooled nuclear reactors. 3,945,883, Cl. 176-40.000.

Hindin, Saul G.; and Dettling, Joseph C., to Engelhard Minerals & Chemicals Corporation. Compositions and methods for high temperature stable catalysts. 3,945,946, Cl. 252-465.000.

Hink, John H.: *See—*
Dabney, William C.; Kristoff, Basil L.; Tuseth, Robert D.; and Hink, John H., 3,945,380.

Hinson, Virgil: *See—*
Jarman, Davis R., 3,945,294.

Hiraga, Masaharu: *See—*
Toyoda, Hiroshi; Shimizu, Shigemi; Terauchi, Kiyoshi; and Hiraga, Masaharu, 3,945,765.

Hirano, Koji: *See—*
Yagi, Hajime; Saito, Yoshihiro; and Hirano, Koji, 3,946,422.

Hiroi, Masayoshi: *See—*
Sato, Tutomu; Horikawa, Kiyomi; Hiroi, Masayoshi; Umino, Shigeyuki; Yamada, Toshio; Takayama, Takashi; and Kayamori, Toru, 3,945,551.

Hiruma, Mituo, to Nissan Motor Company Limited. Vehicle hydropneumatic suspension system. 3,945,664, Cl. 280-124.00F.

Hitachi, Ltd.: *See—*
Atago, Takeshi; Hosho, Yukio; and Shimo, Shoji, 3,945,205.
Fukuhara, Satoru; Yamamoto, Shigehiko; and Okano, Hiroshi, 3,945,698.
Hagiya, Keiichi; Maki, Mamoru; Ogawa, Hiroshi; Hachiya, Takeo; and Ochiai, Kiyozo, 3,945,754.
Iwasawa, Hideo; Wakashima, Yoshiaki; and Inayoshi, Hideo, 3,946,427.
Kamiyama, Takamitsu; and Ashikawa, Mikio, 3,946,151.
Kawagoe, Hiroto, 3,946,251.
Miura, Masaki; Ichiryu, Ken; Shigeta, Masayuki; and Shibata, Tadashi, 3,945,468.
Nishizawa, Jun-ichi; Sasaki, Ichiemon; Ishida, Katsuhiko; Tauchi, Syoji; Nishimura, Takeshi; Seki, Takeo; and Kozuma, Noboru, 3,946,270.
Shoji, Senji; Yasunari, Kenjiro; and Kosa, Yasunobu, 3,946,425.
Tsuji, Rokuro; and Niwa, Toshinori, 3,945,898.
Yoshioka, Yoshio; and Tsukushi, Masanori, 3,946,184.

Hitco: *See—*
Larsen, Richard J.; and Mitchell, Robert W., 3,945,093.

Hoagland, John C.; Rutkowski, Robert; and Yonko, Jon D., to Monsanto Company. Method and apparatus for transferring articles. 3,945,682, Cl. 302-12.000.

Hoard, Bert V. Closure device. 3,945,086, Cl. 24-30.50T.

Hobday, Cyril: *See—*
Corbishley, George Samuel Anthony; Burns, Leonard Walter; Jack, James; Keenan, John Francis Edmund; and Hobday, Cyril, 3,945,793.

Hoechst Aktiengesellschaft: *See—*
Fitz, Herbert; and Mayer, Franz, 3,946,136.

Hoerbiger Ventilwerke Aktiengesellschaft: *See—*
Riedel, Albert F., 3,945,397.

Hoffman, Arnold, to Polaroid Corporation. Battery cell with quaternary ammonium halide. 3,945,849, Cl. 136-107.000.

Hoffmann-La Roche Inc.: *See—*
Brossi, Arnold; Kloetzer, Wilhelm; and Teitel, Sidney, 3,946,041.
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,946,040.

Hohberger, Clive P., to Allen-Bradley Co. Machine tool spindle calibration method and apparatus. 3,945,297, Cl. 90-11.00C.

Hohorst, Wolfgang; and Koellmann, Hans-Josef, to Wago-Kontakttechnik GmbH. Screwless connector or coupling for electric leads. 3,945,711, Cl. 339-95.00D.

Hohorst, Wolfgang: *See—*
Boeke, Uwe; Hennemann, Lothar Roland; Hohorst, Wolfgang; and Urban, Horst, 3,945,701.

Hohwart, George; Toth, Paul; and Cross, Kenneth O., to N. A. Woodworth Company. Adjustable work holding chuck. 3,945,652, Cl. 279-1.00D.

Hokuetsu Kogyo Co. Ltd.: *See—*
Sato, Goro, 3,945,464.

Holden, Arnold I. Bait holding fishing hook assembly. 3,945,145, Cl. 43-44.600.

Holder, Paul Dalton, to Texas Instruments Incorporated. Pushbutton actuator switch with pop-in head. 3,946,182, Cl. 200-159.00B.

Holland, Ronald E., to Winnebago Industries, Inc. Hitch assembly for goose neck trailer. 3,945,668, Cl. 280-423.00R.

Holland, William P.; Swanson, Capleton I.; and Randmer, Jacob A., to Machlett Laboratories, Inc., The. Dual filament X-Ray tube. 3,946,261, Cl. 313-56.000.

Hollandse Signaalapparaten B.V.: *See—*
Van Dort, Jacobus Maurits, 3,945,186.

Hollars, Arnold E.: *See—*
Hollars, Bennie L., 3,945,055.

Hollars, Bennie L., to Hollars, Arnold E., a part interest. Toilet flushing reservoir system. 3,945,055, Cl. 4-30.000.

Hollmann, Gerald J.: *See—*
Hunter, Byron A.; and Hollmann, Gerald J., 3,946,064.

Holmes, Robert W.: *See—*
Dey, Arabinda N.; and Holmes, Robert W., 3,945,848.

Holty, David W.; and Lauterbach, George E., to Nalco Chemical Company. Acrylic acid copolymer as pigment dispersant. 3,945,843, Cl. 106-308.00M.

Honda, Akira: *See—*
Yatsunami, Kazuharu; Miyakado, Satoru; Shiohara, Katsuaki; and Honda, Akira, 3,945,817.

Honeywell Inc.: *See—*
Miller, Edward A., 3,945,648.
Stein, Jeffrey P., 3,946,255.

Honma, Haruo, to Rikagaku Kenkyusho. Method for quantitatively determining oxygen content organic compounds. 3,945,799, Cl. 23-230.0PC.

Hooker Chemicals & Plastics Corporation: *See—*
Hempell, Stephen W.; and Mentz, Ben J., 3,945,908.

Hooper, Harry, to C-R-O Engineering Co., Inc. Formation of segments for containers and the like. 3,945,236, Cl. 72-340.000.

Hopkins, Charles L., to Globe Tool and Engineering Company, The. Solenoid operated fluid valves. 3,946,287, Cl. 317-148.50R.

Hopp, Rudolf: *See—*
Zodrow, Bernhard; Kovacev, Milan; Stengritt, Wolf Dietrich; and Hopp, Rudolf, 3,945,466.

Hoppe, Lutz; and Behn, Rudolf, to Wolff Walsrode AG. Water soluble copolyamide from (1) polyalkylene polyamine, (2) dicarboxylic acid, (3) diamine or lactam or amino acid and (4) epichlorohydrin. 3,945,983, Cl. 260-78.00L.

Horikawa, Kiyomi: *See—*
Sato, Tutomu; Horikawa, Kiyomi; Hiroi, Masayoshi; Umino, Shigeyuki; Yamada, Toshio; Takayama, Takashi; and Kayamori, Toru, 3,945,551.

Horizons Incorporated a division of Horizons Research Incorporated: *See—*
Vicic, John C.; and Sicka, Richard W., 3,945,966.

Horn, Peter; and Kuerten, Heribert, to BASF Aktiengesellschaft. Continuous production of polycarbonates. 3,945,969, Cl. 260-47.0XA.

Horton, James B.: *See—*
Townsend, Herbert E., Jr.; and Horton, James B., 3,945,795.

Horvath, Louis T.; and Allen, Clifford H., to Teleflex Incorporated. Actuator assembly. 3,945,260, Cl. 74-89.170.

Hosaka, Iwao: *See—*
Taniguchi, Tadasu; Hosaka, Iwao; and Yoshida, Shigeru, 3,946,202.
Taniguchi, Tadasu; Hosaka, Iwao; and Yoshida, Shigeru, 3,946,204.

Hosho, Yukio: *See—*
Atago, Takeshi; Hosho, Yukio; and Shimo, Shoji, 3,945,205.
Hosoda, Kiyoshi; Yamauchi, Teruo; and Kobayashi, Masaru, to Suzuki Motor Company, Ltd. Roof plate assembly. 3,945,166, Cl. 52-520.000.
Houck, Theodore B., to Parker Drilling Company. Process of erecting vertical rising mast. 3,945,107, Cl. 29-431.000.
Hough, William T. Radio-pillow device. 3,946,316, Cl. 325-310.000.
Hounsfield, Godfrey Newbold, to E M I Limited. Apparatus for examining bodies by means of penetrating radiation. 3,946,234, Cl. 250-363.00S.
Houston, John Kenneth; and Winter, Andrew Simpson, to Barr and Stroud Limited. Optical scanning systems. 3,946,155, Cl. 178-7.600.
Howie, Robert K., Jr., to Grigoleit Company, The. Rocker actuating mechanism. 3,946,186, Cl. 200-339.000.
Hsu, Sheng Teng, to RCA Corporation. Amplifier employing complementary field-effect transistors. 3,946,327, Cl. 330-35.000.
HTL Industries, Inc.: *See—*
Sitabkhan, Abdul N., 3,946,175.
Huber, Richard, to Klinger AG. Sealing system for shutoff elements. 3,945,390, Cl. 137-1.000.
Hubschmitt, Richard W., to Schneider Tool and Manufacturing Co. Stamp applying machine. 3,945,878, Cl. 156-539.000.
Hudson, Colin: *See—*
Scott, Donald Alan; and Hudson, Colin, 3,945,177.
Hufnagel, Andrew, to Westinghouse Air Brake Company. Fail-safe four leaded zener diode arrangement. 3,946,278, Cl. 317-16.000.
Hughes Aircraft Company: *See—*
Hunsperger, Robert G.; Stoll, Harold M.; Tangonan, Gregory L.; and Yariv, Amnon, 3,945,110.
Oltman, Henry G., Jr.; Pelner, Nathan; and Torgow, Eugene N., 3,946,339.
Tustison, Galen F., 3,946,315.
Weiss, Mitchell, 3,945,128.
Hughes, Richard Smith; and Atkinson, Robert E., to United States of America, Navy. Monopulse pulse width discriminator. 3,946,383, Cl. 343-7.00A.
Hund, Franz, to Bayer Aktiengesellschaft. Production of precipitated red iron (III) oxide pigment relatively free of α-FEOOH. 3,946,103, Cl. 423-633.000.
Hunsperger, Robert G.; Stoll, Harold M.; Tangonan, Gregory L.; and Yariv, Amnon, to Hughes Aircraft Company. Method of making an integrated optical detector. 3,945,110, Cl. 29-572.000.
Hunter, Byron A.; and Holmann, Gerald J., to Uniroyal, Inc. Hydrazodicarboxylates and use thereof as blowing agents. 3,946,064, Cl. 260-463.000.
Hurlocker, Claude Melvin, to International Telephone and Telegraph Corporation. Carrier frequency selector. 3,946,250, Cl. 307-241.000.
Husted, John M.; Gabbard, Ova Gene; and Schmidt, William G., to Communications Satellite Corporation. Distributed bit stuff decision transmission. 3,946,161, Cl. 179-15.0AF.
Hyatt, James Ervin. Hydraulic propulsion system. 3,945,207, Cl. 60-416.000.
Hyytinen, Timo, to Valmet Oy. Gas piston in a firearm. 3,945,296, Cl. 89-191.00A.
I.S.C. Smelting Limited (Metallurgical Development Company): *See—*
Harris, Colin Frank, 3,946,098.
I-T-E Imperial Corporation: *See—*
Gryctko, Carl E.; and Robins, Charles T., 3,946,345.
Votta, Gerald A.; and Kucharski, Leonard J., 3,946,180.
I.W.S. Nominee Company Ltd: *See—*
Allen, Lindsay Alfred, 3,945,189.
Ichiryu, Ken: *See—*
Miura, Masaki; Ichiryu, Ken; Shigeta, Masayuki; and Shibata, Tadashi, 3,945,468.
Ide, Allan R., to Metropolitan Stevedore Company. Load-retaining apparatus. 3,945,674, Cl. 294-67.00R.
Ide, Kimie: *See—*
Arai, Haruhiko; Mino, Junryo; and Ide, Kimie, 3,945,951.
Idemitsu Kosan Company Limited: *See—*
Kobayashi, Haruo; Asajima, Takenori; and Narita, Yoshihiro, 3,945,979.
IEC-Holden Ltd.: *See—*
Winsor, Robert Beck, 3,945,164.
Ihde, Frederick J., Jr., to Diamond Shamrock Corporation. Plasticized polyvinyl chloride compositions containing silicone frothing agents. 3,945,955, Cl. 260-2.50P.
Iida, Yozo, to Nippon Kogaku K.K. Motion picture camera. 3,945,719, Cl. 352-72.000.
Iihashi, Mototaka: *See—*
Nikaido, Norio; Shirai, Shinji; Iihashi, Mototaka; and Umemoto, Sueo, 3,945,899.
Iinoya, Koichi; and Makino, Kazutaka. Dust collector. 3,945,813, Cl. 55-108.000.
Iinuma, Yoshio: *See—*
Yasuda, Tetuya; and Iinuma, Yoshio, 3,945,193.
IIT Research Institute: *See—*
Camras, Marvin, 3,946,147.
Ikeda, Nobuhisa, to Tone Boring Company Limited. Boring apparatus provided with drill bits freely rotatable around their own axis. 3,945,445, Cl. 175-319.000.
Ikeda, Takuo; Hadano, Takushige; and Nogi, Syunsuke, to Sumitomo Chemical Company, Limited. Disazo compounds containing an alkanolamine substituted triazine component. 3,945,990, Cl. 260-153.000.
Ikenberry, Paul F. Centrifugal pumping system. 3,945,756, Cl. 415-66.000.
Ikeuchi, Jun-ichiro; and Tsutsumi, Teruo, to Tokyo Shibaura Electric Co., Ltd. Electrostatic recorder with three state switching. 3,946,403, Cl. 346-74.0EE.
Ilford Limited: *See—*
Mangan, Clifford, 3,945,584.
Illetschko, Gerhard; and Peth, Horst. Correction system for video signals having a limited amplitude range. 3,946,152, Cl. 178-7.100.
Illetschko, Gerhard: *See—*
Peth, Horst; and Illetschko, Gerhard, 3,946,153.
Ilmeg AB: *See—*
Jysky, Goran; Mardla, Ilmar; and Ericsson, Bjorn, 3,945,613.
Image Analysing Computers Limited: *See—*
Cruttwell, Ian Andrew; and Smith, David Theo, 3,946,361.
Imai, Satoshi; Eguchi, Tamiyuki; and Shimokawa, Masaaki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Ion-exchange group bearing composite membranes. 3,945,927, Cl. 210-500.00M.
Imazu, Katsuhiro; and Miyata, Masao, to Toyo Seikan Kaisha Limited. Process and apparatus for preparation of thin walled cylindrical vessels. 3,945,231, Cl. 72-45.000.
Imperial Chemical Industries Limited: *See—*
Case, John Reginald; and Moore, Geoffrey James, 3,946,023.
Collins, Thomas Robert Stephen, 3,945,784.
Gibson, Andrew; and Turner, Trevor John, 3,945,320.
Todd, Peter Frank, 3,946,066.
Imperial Metal Industries (Kynoch) Limited: *See—*
Burgess, Brian; Bayliss, Raymond Terence; Stokes, Peter Bryan; and Eynon, George Thomas, 3,945,573.
Imre, Laszlo: *See—*
Wedemeyer, Karl-Friedrich; and Imre, Laszlo, 3,946,081.
IMS Limited: *See—*
Ogle, Robert Walter, 3,945,382.
Inaga, Hisashi: *See—*
Nagashima, Akira; and Inaga, Hisashi, 3,945,119.
Inagaki, Takeo: *See—*
Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Nagayama, Masuzo, 3,946,055.
Inayoshi, Hideo: *See—*
Iwasawa, Hideo; Wakashima, Yoshiaki; and Inayoshi, Hideo, 3,946,427.
Inazaki, Kenzoo; Kanatani, Yoshiharu; Ise, Masahiro; Mizukami, Etsuo; and Suzuki, Chuji, to Sharp Kabushiki Kaisha. Drive system for memory matrix panel. 3,946,371, Cl. 340-173.0PL.
Index-Werke KG Hahn & Tessky: *See—*
Lahm, Heinrich, 3,946,296.
Industrial Clean Air, Inc.: *See—*
Slakey, Philip B., 3,945,400.
Industrias Rumbo, S.A.: *See—*
Garcia, Jose Juan, 3,946,314.
Ing. C. Olivetti & C., S.p.A.: *See—*
Pomella, Piero; Lauro, Luciano; and Scotti, Pier Gianni, 3,946,189.
Ing. C. Olivetti & Co., S.p.A.: *See—*
Marraccini, Franco, 3,945,596.
Inion, Henri: *See—*
Descamps, Margel; and Inion, Henri, 3,946,029.
Innovatex Corporation: *See—*
Voitik, Robert M., 3,945,650.
Inoue, Kazuo, to Kabushiki Kaisha Komatsu Seisakusho. Lifting apparatus with hydraulic operated means to move a counterweight thereon. 3,945,518, Cl. 214-142.000.
Inoue, Shiro, to Kabushiki Kaishya Inoue Seisakushyo. Transfer pinion carrier plate for odometers. 3,945,563, Cl. 235-96.000.
Inoue, Yoshimi; and Yukie, Takeo, to Kabushiki Kaisha Asahi Shimbunsha. Apparatus of making reproduction printing plates. 3,945,788, Cl. 425-363.000.
Inoue, Yoshio: *See—*
Noshiro, Atsumi; and Inoue, Yoshio, 3,945,957.
Instapak Corporation: *See—*
Sperry, Charles R., 3,945,569.
Institut Francais du Petrole des Carburants et Lubrifiants: *See—*
Hillion, Gerard; and Lassau, Christian, 3,946,087.
Intel Corporation: *See—*
Chou, Sunlin, 3,946,368.
Pashley, Richard D., 3,946,369.
International Business Machines Corporation: *See—*
Castrodale, Daniel Owen; Steele, Steven Gary; Wentink, William Stewart; and Wheeler, Stephen Edward, 3,946,439.
DeWitt, David; and Johnson, William S., 3,946,419.
Hahn, Guenter; Lampe, Hans Hermann; and Rudolph, Peter, 3,946,378.
Jacobus, William N., Jr.; and Ku, San-Mei, 3,946,417.
Koenig, Wilfried G.; Makris, James S.; and Masters, Burton J., 3,945,856.
International Flavors & Fragrances Inc.: *See—*
Klaiber, Erich Manfred; and Pittet, Alan Owen, 3,946,054.
International Harvester Company: *See—*
Barkstrom, Reynold; Rickerd, Calvin P.; and Swanson, William C., 3,945,175.
Sinclair, Donald J., 3,945,180.
International Nickel Company, Inc., The: *See—*
Sullivan, Arthur Francis; Brockett, Frank Howard, III; and Harthan, Lewis John, III, 3,945,394.
International Paper Company: *See—*
Elder, Jerome Earl, 3,945,558.

International Shoe Machine Corporation: *See*—
Vornberger, Walter, 3,945,075.
International Standard Electric Corporation: *See*—
Froom, Jocelyn; and Carroll, John Edward, 3,946,336.
Gassman, Gerhard-Gunter, 3,946,162.
Overbury, Francis G.; Barton, Paul; and Kelly, Kevin M., 3,946,320.
Overbury, Francis G.; and Barton, Paul, 3,946,386.
Solberg, Bjorn Ragnar, 3,946,253.
International Telephone and Telegraph Corporation: *See*—
Corcoran, Donald G., 3,945,721.
Greenwood, Roger, 3,945,401.
Griffin, Richard H., 3,945,708.
Gruber, Alan Herbert, 3,946,318.
Hurlocker, Claude Melvin, 3,946,250.
Robison, James Ray, 3,945,904.
Intersil, Inc.: *See*—
Gruner, George, 3,946,185.
Ion, John C.; and Zieber, George M., Jr., to Teleflex Incorporated. Motion transmitting remote control assembly. 3,945,268, Cl. 74-501.00R.
Iowa State University Research Foundation, Inc.: *See*—
Day, Clifford K.; and Koerber, George G., 3,946,256.
Irie, Toshiaki: *See*—
Anazawa, Shinzo; Ueno, Seiichi; Nagasako, Isamu; Nawa, Tadashi; Irie, Toshiaki; and Sando, Shigeru, 3,946,428.
Irwin, James S., to Motorola, Inc. Inductor or antenna arrangement with integral series resonating capacitors. 3,946,397, Cl. 343-788.000.
Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Nagayama, Masuzo, to Lion Fat & Oil Co., Ltd. Method of manufacturing carboxylic acid or ester thereof. 3,946,055, Cl. 260-410.90R.
Isaksson, Ove; and Engberg, Rolf, to Isaksson, Ove Gustav. Safety device for dynamic units. 3,946,288, Cl. 317-148.50R.
Isaksson, Ove Gustav: *See*—
Isaksson, Ove; and Engberg, Rolf, 3,946,288.
Ise, Masahiro: *See*—
Inazaki, Kenzoo; Kanatani, Yoshiharu; Ise, Masahiro; Mizukami, Etsuo; and Suzuki, Chuji, 3,946,371.
Ishida, Katsuhiko: *See*—
Nishizawa, Jun-ichi; Sasaki, Ichiemon; Ishida, Katsuhiko; Tauchi, Syoji; Nishimura, Takeshi; Seki, Takeo; and Kozuma, Noboru, 3,946,270.
Ishihara, Takayuki: *See*—
Ito, Yoshio; Takahashi, Toru; Ishihara, Takayuki; Kobayashi, Hiroo; and Matsuoka, Atsushi, 3,945,726.
Ishii, Kiyoshi; Fuse, Shigeru; and Takashima, Masatake, to Shaken Co., Ltd. Manually operated photocomposing apparatus. 3,946,407, Cl. 354-6.000.
Ishii, Mitsuaki: *See*—
Sumida, Shizuo; Nii, Kazuo; Ito, Hisatsugu; Ueda, Atsushi; and Ishii, Mitsuaki, 3,946,362.
Ishikawa, Yoshikazu, to Nissan Motor Company Limited. Rotary internal combustion engine and a method of operating the same. 3,945,345, Cl. 123-8.050.
Ishimaru, Satoshi; and Nakano, Shoitsu, to Matsushita Electric Industrial Company, Ltd. Radio receiver. 3,946,317, Cl. 325-354.000.
Ishimori, Shigeru; and Otsuka, Shinjiro, to Suzuki Motor Company Limited. Process for forming low-abrasion surface layers on metal objects. 3,945,893, Cl. 204-16.000.
Isuzu Motors Limited: *See*—
Kimbara, Motoyasu; and Shimomukai, Hiroshi, 3,945,351.
Ito, Hisatsugu: *See*—
Sumida, Shizuo; Nii, Kazuo; Ito, Hisatsugu; Ueda, Atsushi; and Ishii, Mitsuaki, 3,946,362.
Ito, Yoshio; Takahashi, Toru; Ishihara, Takayuki; Kobayashi, Hiroo; and Matsuoka, Atsushi, to Canon Kabushiki Kaisha. Electrophotographic fixing device. 3,945,726, Cl. 355-3.00R.
ITT Industries, Inc.: *See*—
Gollinger, Wolfgang, 3,945,194.
ITW Limited: *See*—
Burt, David A., 3,945,594.
Iwano, Haruhiko, to Fuji Photo Film Co., Ltd. Activation of silver halide photographic developers. 3,945,828, Cl. 96-66.00R.
Iwasawa, Hideo; Wakashima, Yoshiaki; and Inayoshi, Hideo, to Hitachi, Ltd. Semiconductor device. 3,946,427, Cl. 357-72.000.
Iwasawa, Mineo: *See*—
Harada, Nozomu; and Iwasawa, Mineo, 3,946,223.
Iwata, Kaoru; and Hara, Shigeyoshi, to Teijin Ltd. Process for the preparation of hydantoin derivatives. 3,946,033, Cl. 260-309.500.
Iwaya, Shoichi: *See*—
Yoshioka, Tsunehiko; Oyamada, Yasutaka; Iwaya, Shoichi; and Sato, Minoru, 3,946,290.
Izumi, Yusuke: *See*—
Mizutani, Yukio; Izumi, Yusuke; and Watanabe, Yoshiaki, 3,946,079.
J. D. Moller Optische Werke GmbH: *See*—
Klein, Friedrich, 3,945,597.
J. M. Voith GmbH: *See*—
Egelhof, Dieter; and Wolf, Karl, 3,945,882.
J. R. Clarkson Company, The: *See*—
Clarkson, Curtis W., 3,945,604.
Jack Barnes Engineering, Inc.: *See*—
Barnes, John O.; and Barnes, Carl K., 3,945,154.
Jack, James: *See*—
Corbishley, George Samuel Anthony; Burns, Leonard Walter; Jack, James; Keenan, John Francis Edmund; and Hobday, Cyril, 3,945,793.
Jackson, Earl V., to Xerox Corporation. Velocity compensation for bead bypass. 3,945,724, Cl. 355-3.00P.
Jackson, George R. Dye gun marker. 3,945,341, Cl. 118-7.000.
Jackson, William E., to Goodyear Tire & Rubber Company, The. Method for obtaining polyester laminates and said laminates. 3,945,875, Cl. 156-308.000.
Jacob, Ezekiel J. Xerographic toner composition. 3,945,934, Cl. 252-62.10P.
Jacobus, William N., Jr.; and Ku, San-Mei, to International Business Machines Corporation. Minimizing cross-talk in L.E.D. arrays. 3,946,417, Cl. 357-17.000.
Jacoby, Hans-Dieter; and Schuster, Erich, to Ernst Leitz GmbH. Contact sensor for workpiece calipering. 3,945,124, Cl. 33-169.00R.
Jacquet, Bernard; Papantoniou, Christos; Dufaure, Pierre; and Mahieux, Claude, to L'Oreal. Anti-inflammatory polymers, pharmaceutical compositions containing the same and process for producing said polymers. 3,946,035, Cl. 260-243.00A.
Jaffee, Michael L.: *See*—
Davis, Herbert L.; Jaffee, Michael L.; and Besso, Michael M., 3,946,100.
Jagusch, Leonhard; and Schonherr, Werner, to VEB Chemieanlagenbau-und Montegekombinat. Installation for charging liquids, particularly fermentation liquids, with gas. 3,945,922, Cl. 210-195.00R.
Jakimowicz, Christopher; and Duford, Thomas G., to National Steel Corporation. Limiting control arrangement for exhaust system operation. 3,945,308, Cl. 98-115.00R.
Jakob, Horst, to Prestil. Multiple filament woven-in slide fastener element. 3,945,407, Cl. 139-384.00B.
James Burn Bindings Limited: *See*—
Adams, Sidney George William, 3,945,073.
James, George Stephen; Dewar, Bruce Ian; and Moergeli, Walter Rudolf, to Parel. Societe Anonyme. Electrochemical process and apparatus including means for equalizing pressure across the ion-permeable wall. 3,945,892, Cl. 204-1.00R.
Jamieson, Ernest: *See*—
Robinson, Franklin H.; Rakow, Marvin S.; and Jamieson, Ernest, 3,946,053.
Jamnig, Walter: *See*—
Scherr, Rudolf; Jamnig, Walter; Gott, Hans; and Ritter, Klaus, 3,945,409.
Janson, Walter: *See*—
Stehle, Heinz; Assmann, Helmut; Wahode, Peter; and Janson, Walter, 3,945,245.
Janssen, Paul; and Steffen, Klaus-Dieter, to Dynamit Nobel Aktiengesellschaft. Method of preparing alkylalkoxysilanes containing polysulfide bridges. 3,946,059, Cl. 260-448.20E.
Jaquiss, Donald B. G., to General Electric Company. Thermally stable polycarbonate composition. 3,945,967, Cl. 260-45.80A.
Jarke Corporation: *See*—
Jay, Richard S., 3,945,501.
Jarman, Davis R., to Hinson, Virgil, a part interest. Expandable anchor bolt. 3,945,294, Cl. 85-63.000.
Jarrell, Richard P., Jr. Knee protector. 3,945,047, Cl. 2-24.000.
Jay, Richard S., to Jarke Corporation. Storage rack with internestable stacking attachments. 3,945,501, Cl. 211-177.000.
Jekat, Hans, to Hewlett-Packard Company. High frequency counter having signal level sensitivity. 3,946,209, Cl. 235-92.0DE.
Jenkins, Theron W., Jr., to Leeds & Northrup Company. Amplitude limited filter. 3,946,211, Cl. 235-151.100.
Jensen, Jay W.: *See*—
Higbee, Wallace C.; Jensen, Jay W.; and Walker, Ronald J., 3,945,586.
Jidosha Kiki Co., Ltd.: *See*—
Masuda, Naosuke; and Yanagawa, Itiro, 3,945,689.
Masuda, Naosuke; Yanagawa, Itiro; and Suzuki, Isao, 3,945,690.
John Ratcliff (Tail Lifts) Limited: *See*—
Peck, Albert William; and Richardson, Reginald Stephen, 3,945,516.
Johnsen, Edward L. Method of making multi-layer composite and articles therefrom. 3,945,870, Cl. 156-201.000.
Johnson, Allan S. Universal floating tool holder. 3,945,751, Cl. 408-127.000.
Johnson, Harold W. Vacuum packaging system. 3,945,172, Cl. 53-112.00A.
Johnson, James N.: *See*—
Fritsch, Robert A.; Mayo, James C., Sr.; and Johnson, James N., 3,945,333.
Johnson, Jerry Dean, to Environ Control Products, Inc. Method for forming a refractory cellular product. 3,945,816, Cl. 65-22.000.
Johnson & Johnson: *See*—
Green, Percy, 3,945,842.
Johnson, Luther J., Jr.: *See*—
McGehee, C. Bernie; Rees, J. Samuel; and Johnson, Luther J., Jr., 3,945,277.
Johnson, Matthey & Co., Limited: *See*—
Westwood, Walter; and Payne, John Blunden, 3,945,948.
Johnson, Robert A.: *See*—
Kockler, Barry C.; Johnson, Robert A.; and Leinberger, Merton C., 3,945,636.
Johnson, Robert W.; and Doherty, Paul R., to Cryogenic Technology, Inc. Low-loss, fluid helium transfer line suitable for extended lengths. 3,945,215, Cl. 62-55.000.

Johnson, Roger L.; and Weber, Larry F., to National Science Foundation. Graphic system apparatus utilizing plasma display/memory devices with direct electrical read-out. 3,946,381, Cl. 340-173.00R.

Johnson Service Company: *See—*
Bechtel, Jon Harold, 3,946,297.

Johnson, William S.: *See—*
DeWitt, David; and Johnson, William S., 3,946,419.

Johnston, Mervyn B., to Textron Inc. Exhaust port of two cycle engine. 3,945,354, Cl. 123-65.00P.

Johnston, Richard W.: *See—*
Neuman, John G.; and Johnston, Richard W., 3,945,362.

Jonas Woodhead Limited: *See—*
Duckett, William Arthur, 3,945,663.

Jones, David Vernon Hudson, to Coates Brothers & Company Limited. Preparation of reprographic sheets. 3,946,129, Cl. 428-304.000.

Jones, Eugene C., to American Hospital Supply Corporation. Closure system for medical liquid container having low-torque breakaway ring. 3,945,525, Cl. 215-232.000.

Jones, Frederick L., to Monarch Marking Systems, Inc. Compositions and methods relating to transfer processes. 3,946,138, Cl. 428-514.000.

Jones, George T. Compound bow with rotational indicators for eccentric wheels on bow limbs. 3,945,368, Cl. 124-24.00R.

Jones, Hartl R.: *See—*
Skoli, Sigmund P.; Witt, Chester J.; and Jones, Hartl R., 3,945,411.

Jones, Richard H.: *See—*
Braun, Robert E.; Jones, Richard H.; Sprenkle, George J.; and Stopper, Herbert, 3,946,276.

Julien, Brian E.: *See—*
Anczurowski, Edward; and Julien, Brian E., 3,945,386.

Jung, Michel: *See—*
Metcalf, Brian Walter; and Jung, Michel, 3,946,060.

Jung, Rolf: *See—*
Boehme, Dietrich; Hahn, Gunter; Schumann, Gunter; Wienen, Walter; and Jung, Rolf, 3,945,279.

Junusov, Edem Idrisovich: *See—*
Listov, Petr Nikolaevich; Ganiev, Madzhid Saidovich; Buromsky, Vladimir Ivanovich; Bogdanova, Lidia Ivanovna; Kalafatov, Enver Tefikovich; Topalidi, Dmitry Nikolaevich; Rodionov, Vitaly Petrovich; Junusov, Edem Idrisovich; and Fedorov, Valery Pavlovich, 3,945,179.

Juodikis, Peter, to GCA Corporation. Proportional temperature controller. 3,946,200, Cl. 219-499.000.

Juodikis, Peter, to GCA Corporation. Integral cycle power controller. 3,946,252, Cl. 307-252.00B.

Jurd, Leonard, to United States of America, Agriculture. Alkylcinnamylphenols as mosquito larvicides. 3,946,047, Cl. 424-346.000.

Jysky, Goran; Mardla, Ilmar; and Ericsson, Bjorn, to Ilmeg AB. Vibrating device. 3,945,613, Cl. 259-1.00R.

Kabushiki Kaisha Asahi Shimbunsha: *See—*
Inoue, Yoshimi; and Yukie, Takeo, 3,945,788.

Kabushiki Kaisha Daini Seikosha: *See—*
Kawamura, Yasukazu, 3,946,257.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Asamoto, Hiroshi, 3,945,676.
Inoue, Kazuo, 3,945,518.
Tomioka, Shozo; Matsushima, Shujiro; Koezuka, Yokichi; Tanabe, Geniti; and Nakasyo, Koichi, 3,945,230.

Kabushiki Kaisha Maekawa Seisakusho: *See—*
Kasahara, Keisuke, 3,945,219.

Kabushiki Kaisha Mitutoyo Seisakusho: *See—*
Nakaya, Tadao, 3,945,258.

Kabushiki Kaisha Seikosha: *See—*
Yanagisawa, Takeshi, 3,945,340.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Katoh, Takashi; and Otani, Susumu, 3,945,085.

Kabushiki Kaishya Inoue Seisakushyo: *See—*
Inoue, Shiro, 3,945,563.

Kabushikikaisha Yokogawa Denki Seisakusho: *See—*
Miura, Shigetaka; and Oikawa, Masashi, 3,946,406.

Kacsmarek, Bela: *See—*
Enody, Emil; Kovacs, Sandor; Gelanyi, Istvan; Karoly, Bela; and Kacsmarek, Bela, 3,945,072.

Kahabka, Richard D.: *See—*
Seim, William J.; and Kahabka, Richard D., 3,945,705.

Kahmann, Albrecht, to Escher Wyss GmbH. Stock pulper. 3,945,576, Cl. 241-46.170.

Kahnke, Dieter: *See—*
Keib, Heinz; and Kahnke, Dieter, 3,945,814.

Kaiser Aluminum & Chemical Corporation: *See—*
Foye, John J., 3,945,425.

Kaiser Steel Corporation: *See—*
Walker, Andrew; Long, Charles Frederick; and Birks, Harry Davies, 3,945,426.

Kalafatov, Enver Tefikovich: *See—*
Listov, Petr Nikolaevich; Ganiev, Madzhid Saidovich; Buromsky, Vladimir Ivanovich; Bogdanova, Lidia Ivanovna; Kalafatov, Enver Tefikovich; Topalidi, Dmitry Nikolaevich; Rodionov, Vitaly Petrovich; Junusov, Edem Idrisovich; and Fedorov, Valery Pavlovich, 3,945,179.

Kali-Chemie AG: *See—*
Musall, Reimar; Wolsing, Wilhelm; and Almeroth, Klaus, 3,945,803.

Kamachi, Hajime: *See—*
Naito, Takayuki; Okumura, Jun; and Kamachi, Hajime, 3,946,000.

Kaminski, Ben E.: *See—*
Eisenmann, James R.; Kaminski, Ben E.; and Waddoups, Max E., Jr., 3,946,127.

Kaminsky, Igor Vasilievich; Pimenov, Viktor Alexeevich; and Severov, Genrikh Fedorovich. Machine for winding casings. 3,945,578, Cl. 242-7.210.

Kamiyama, Takamitsu; and Ashikawa, Mikio, to Hitachi, Ltd. Semiconductor image sensor. 3,946,151, Cl. 178-7.100.

Kamperman, David Robert, to Dart Environment and Services Company. Metal dissolution process. 3,945,865, Cl. 156-18.000.

Kanatani, Yoshiharu: *See—*
Inazaki, Kenzoo; Kanatani, Yoshiharu; Ise, Masahiro; Mizukami, Etsuo; and Suzuki, Chuji, 3,946,371.

Kaneda, Ryoji: *See—*
Sugiyama, Noboru; Suzuki, Masamichi; Watanabe, Katami; Sugiyama, Keiichi; Tadenuma, Hachiro; Kato, Takashi; Kaneda, Ryoji; and Yoshino, Makoto, 3,945,930.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Imai, Satoshi; Eguchi, Tamiyuki; and Shimokawa, Masaaki, 3,945,927.

Kaneko, Fuminori; Ureshino, Kashirou; and Tomita, Masahiro, to Kobe Steel, Ltd. Method and apparatus for helically winding wire on a ring-shaped core. 3,945,577, Cl. 242-4.00C.

Kanetsuna, Hisaaki; and Kurita, Toshio, to Agency of Industrial Science & Technology. Method for manufacturing filaments of crystalline plastics thereof. 3,946,094, Cl. 264-28.000.

Kang, Chia-Chen Chu. Catalyst for the production of hydrogen and/or methane. 3,945,944, Cl. 252-455.00R.

Kansai Paint Company, Limited: *See—*
Nikaido, Norio; Shirai, Shinji; Iihashi, Mototaka; and Umemoto, Sueo, 3,945,899.

Kansy, Robert, to University of Illinois Foundation. Method and apparatus for making a surface wave transducer device. 3,945,099, Cl. 29-25.350.

Kao Soap Co., Ltd.: *See—*
Arai, Haruhiko; Mino, Junryo; and Ide, Kimie, 3,945,951.

Karabinos, Joseph V.: *See—*
Karsten, Kenneth S.; and Karabinos, Joseph V., 3,946,016.

Karl M. Reich Maschinenfabrik GmbH: *See—*
Gebhardt, Fritz, 3,945,285.

Karoly, Bela: *See—*
Enody, Emil; Kovacs, Sandor; Gelanyi, Istvan; Karoly, Bela; and Kacsmarek, Bela, 3,945,072.

Karrer, Friedrich, to Ciba-Geigy Corporation. Phenoxyphenyl 1-alkoxy-3-methylbutenyl ethers. 3,946,084, Cl. 260-613.00R.

Karssky, Vladimir Evgenievich: *See—*
Milman, Boris Samoilovich; Mirzoian, Genrikh Sergeevich; Strizhov, Gennady Sergeevich; Tinyakov, Viktor Gurievich; Doroschenko, Pavel Petrovich; Karssky, Vladimir Evgenievich; Levin, Moisei Markovich; Krapukhin, Viktor Mikhailovich; and Semenov, Pavel Vladimirovich, 3,945,427.

Karsten, Kenneth S.; and Karabinos, Joseph V., to R. T. Vanderbilt Company, Inc. Fungicidal 8-quinolyl carbanilates. 3,946,016, Cl. 260-287.00L.

Kasahara, Keisuke, to Kabushiki Kaisha Maekawa Seisakusho. Method of and apparatus for preventing overheating of electrical motors for compressors. 3,945,219, Cl. 62-469.000.

Kast, Hellmut: *See—*
Schefczik, Ernst; and Kast, Hellmut, 3,946,017.

Kastorskaya, Natalya Nikolaevna: *See—*
Ulyanov, Lev Petrovich; Borisenkov, Oleg Nikolaevich; Kastorskaya, Natalya Nikolaevna; Vinogradov, Georgy Vladimirovich; Yanovsky, Jury Grigorievich; and Sergeenkov, Sergei Ivanovich, 3,945,242.

Katakabe, Noboru: *See—*
Nakajima, Yasutaka; Sasaki, Toshiharu; and Katakabe, Noboru, 3,945,727.

Kathawala, Faizulla G., to Sandoz, Inc. Optionally substituted α-tertiary butyl-p-phenoxybenzylamines and their use as hypolipidemic agents. 3,946,119, Cl. 424-330.000.

Kato, Koichi: *See—*
Takahashi, Takeshi; Kawahara, Kenji; Takahashi, Toshiyuki; Kato, Koichi; and Yamazaki, Yoshio, 3,945,888.

Kato, Koji: *See—*
Tobita, Susumu; Shimoishizaka, Masashi; Sumita, Yuzo; Oishi, Isamu; and Kato, Koji, 3,945,552.

Kato, Takashi: *See—*
Sugiyama, Noboru; Suzuki, Masamichi; Watanabe, Katami; Sugiyama, Keiichi; Tadenuma, Hachiro; Kato, Takashi; Kaneda, Ryoji; and Yoshino, Makoto, 3,945,930.

Kato, Yasuaki: *See—*
Suizu, Dairi; and Kato, Yasuaki, 3,945,522.

Katoh, Takashi; and Otani, Susumu, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method and apparatus for plucking fiber tufts from a fiber bale. 3,945,085, Cl. 19-80.00R.

Katsube, Junki: *See—*
Matsui, Masanao; Katsube, Junki; Shimomura, Hiromi; and Murayama, Eichi, 3,946,065.

Katz, Joel, to United States of America, Navy. Pulse duty cycle transition moderating device. 3,946,322, Cl. 328-58.000.

Kawabe, Noriyuki: *See—*
Yamazaki, Chikayasu; Nakayama, Takao; and Kawabe, Noriyuki, 3,945,181.

Kawagoe, Hiroto, to Hitachi, Ltd. Pulse level correcting circuit. 3,946,251, Cl. 307-237.000.

Kawahara, Kenji: *See—*
Takahashi, Takeshi; Kawahara, Kenji; Takahashi, Toshiyuki; Kato, Koichi; and Yamazaki, Yoshio, 3,945,888.

Kawai, Masayoshi: *See—*
Sakai, Tadao; Kawai, Masayoshi; Yamamoto, Nobuo; and Yoneyama, Masakazu, 3,945,824.

Kawai, Toshiyuki: *See—*
Yanagisawa, Ikuo; and Kawai, Toshiyuki, 3,945,428.

Kawajiri, Seizo: *See—*
Nagamatsu, Kazuo; Kinoshita, Yoshitsugu; Kawajiri, Seizo; and Uda, Yoshiaki, 3,945,796.

Kawamura, Yasukazu, to Kabushiki Kaisha Daini Seikosha. Quartz crystal vibrator with partial electrodes for harmonic suppression. 3,946,257, Cl. 310-9.600.

Kawarabayashi, Susumu: *See—*
Matsui, Isamu; Sakai, Shoji; Tsukada, Susumu; and Kawarabayashi, Susumu, 3,945,488.

Kayamori, Toru: *See—*
Sato, Tutomu; Horikawa, Kiyomi; Hiroi, Masayoshi; Umino, Shigeyuki; Yamada, Toshio; Takayama, Takashi; and Kayamori, Toru, 3,945,551.

Kayser, Lutz Tilo. Liquid-fueled rocket. 3,945,203, Cl. 60-259.000.

Kaziwara, Tosiro: *See—*
Kinoshita, Isao; Nagara, Tosio; and Kaziwara, Tosiro, 3,945,454.

Kearney-National Inc.: *See—*
Westrom, Arthur C., 3,945,699.

Keck, William G., to United States of America, Navy. Underwater electrical potential detection system. 3,946,354, Cl. 340-4.00E.

Keeffe, William M.; and Koury, Frederic, to GTE Sylvania Incorporated. High pressure electric discharge device with hafnium getter. 3,946,262, Cl. 313-174.000.

Keenan, John Francis Edmund: *See—*
Corbishley, George Samuel Anthony; Burns, Leonard Walter; Jack, James; Keenan, John Francis Edmund; and Hobday, Cyril, 3,945,793.

Keib, Heinz; and Kahnke, Dieter, to Glaswerk Schuller GmbH. Apparatus for feeding particles of glass into crucibles for extrusion of glass filaments. 3,945,814, Cl. 65-11.00R.

Keller, Heinz-Jochen: *See—*
Forster, Friedrich; Barth, Erich; and Keller, Heinz-Jochen, 3,946,104.

Kellerman, Rudolph; and Fischer, James L., to Textron Inc. Centrifugal clutch with one piece rotor. 3,945,478, Cl. 192-105.0CD.

Kellow, Mazin; VanSant, James; and Bonneville, Jacques. Cooling of power cables utilizing an open cycle cooling system. 3,946,142, Cl. 174-15.00C.

Kelly, Kevin M.: *See—*
Overbury, Francis G.; Barton, Paul; and Kelly, Kevin M., 3,946,320.

Kelly, Robert C., to Upjohn Company, The. Resolution of prostaglandin intermediates by means of oxazolidines. 3,946,046, Cl. 260-343.30R.

Kemp, Klaus M. Converter system. 3,945,890, Cl. 202-84.000.

Kennedy, Thomas W., Jr.; and Smith, Harry D., to Sperry Rand Corporation. Semi-automatic takeoff control system for aircraft. 3,945,590, Cl. 244-77.00A.

Kent-Moore Corporation: *See—*
Clogg, William G., 3,945,410.

Kenyon, Richard L.: *See—*
Reinicke, Robert H.; and Kenyon, Richard L., 3,945,395.

Keppeler, Dieter, to Carl Walther, Sportwaffenfabrik. Mount for a sight on firearms. 3,945,142, Cl. 42-1.00S.

Kepper, George John, to Haca Pty. Ltd. Taximeter. 3,946,213, Cl. 235-151.320.

Kermisch, Dorian, to Xerox Corporation. Phase image scanning method. 3,946,433, Cl. 358-41.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Labus, Herwig, 3,945,777.

Kessler, Sebastian William, Jr., to RCA Corporation. Self-fusing transcalent electrical device. 3,946,429, Cl. 357-81.000.

Kesting, Robert E., to Chemical Systems, Inc. Integral microporous high void volume polycarbonate membranes and a dry process for forming same. 3,945,926, Cl. 210-500.00M.

Khann, Pushpa; Nag, Tej Narain; Chandrajain, Satish; and Mohan, Suchendra. Process for isolation of insulin from plant source. 3,945,988, Cl. 260-112.700.

Khatti, Ramkishan, to Allis-Chalmers Corporation. Pressurized differential valve. 3,945,475, Cl. 192-4.00A.

Kilcup, Dillon K.: *See—*
Komberec, Harold L.; and Kilcup, Dillon K., 3,945,313.

Kilet, Charles R.: *See—*
Oswald, Robert A.; and Kilet, Charles R., 3,946,312.

Kimbara, Motoyasu; and Shimomukai, Hiroshi, to Isuzu Motors Limited. Combustion chamber of a direct fuel injection type diesel engine. 3,945,351, Cl. 123-32.00B.

Kimura, Satoshi; Mochizuki, Yoshifumi; and Yasuda, Tetsuya, to Citizen Watch Co., Ltd. Switch mechanism for electronic timepiece. 3,945,190, Cl. 58-4.00A.

Kinder, Floyd A., to United States of America, Navy. Rotatable head up display with coordinate reversal correctives. 3,945,716, Cl. 350-174.000.

King-Korai, Inc.: *See—*
Krol, Harry J., 3,945,293.

Kinnunen, Paavo; and Lukkarinen, Viljo, to UPO Oskeyhtio. Device for controlling the formation of frost on cooling radiators and the defrosting of the same. 3,946,286, Cl. 317-124.000.

Kinoshita, Isao; Nagara, Tosio; and Kaziwara, Tosiro, to Yamaha Hatsudoki Kabushiki Kaisha; and Nippon Denso Co., Ltd. Radiator for a vehicle engine. 3,945,454, Cl. 180-68.00R.

Kinoshita, Yoshitsugu: *See—*
Nagamatsu, Kazuo; Kinoshita, Yoshitsugu; Kawajiri, Seizo; and Uda, Yoshiaki, 3,945,796.

Kinsolving, C. Richard: *See—*
Carr, Albert A.; and Kinsolving, C. Richard, 3,946,022.

Kioritz Corporation: *See—*
Nagashima, Akira; and Inaga, Hisashi, 3,945,119.

Kiovsky, Joseph R.; and Meacham, Jeffrey W., to Norton Company. High surface area alumina bodies. 3,945,945, Cl. 252-463.000.

Kirchhoff, C. Edward. Radio direction finding apparatus. 3,946,395, Cl. 343-113.00R.

Kirk, Bradley S., to Airco, Inc. Methods and apparatus for treating a liquid with a gas. 3,945,918, Cl. 210-44.000.

Kirkham, Peter H.: *See—*
Anderson, Martin; and Kirkham, Peter H., 3,945,998.

Kishikawa, Toshiro: *See—*
Doi, Yoshikazu; Kishikawa, Toshiro; and Yamada, Hiroshi, 3,945,713.

Kishimoto, Shinzo: *See—*
Yazawa, Kenichiro; Kishimoto, Shinzo; Miyano, Shizuo; and Kondo, Asaji, 3,945,830.

Kitai, Kiyoshi, to Seiko Koki Kabushiki Kaisha. Electric shutter with positive motion device. 3,946,414, Cl. 354-258.000.

Kitamura, Hajime: *See—*
Koyanagi, Shunichi; Kitamura, Hajime; and Shimizu, Toshihide, 3,945,958.

Kiyonaga, Yasuhiro: *See—*
Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Nagayama, Masuzo, 3,946,055.

Klahre, Manfred: *See—*
Herold, Hans; and Klahre, Manfred, 3,945,095.

Klaiber, Erich Manfred; and Pittet, Alan Owen, to International Flavors & Fragrances Inc. Keto-ester composition. 3,946,054, Cl. 260-408.000.

Klaue, Hermann. Drive for four-wheel driven motor vehicles. 3,945,452, Cl. 180-24.090.

Klein, Friedrich, to J. D. Moller Optische Werke GmbH. Microsurgical operating unit. 3,945,597, Cl. 248-327.000.

Klemar, Benny Aaris: *See—*
Bisgaard, Hans Flinker; and Klemar, Benny Aaris, 3,945,255.

Kline, Richard H.: *See—*
Daniels, Elon, Jr.; and Kline, Richard H., 3,945,097.

Klinger AG: *See—*
Huber, Richard, 3,945,390.

Klingler, Thomas C.: *See—*
Goralski, Christian T.; and Klingler, Thomas C., 3,946,007.

Klingner, Hartmut: *See—*
Mallwitz, Detlef; Klingner, Hartmut; and Kubbetat, Wolfgang, 3,945,600.

Klinkowski, Peter R., to Dorr-Oliver Incorporated. Electro ultrafiltration process and apparatus. 3,945,900, Cl. 204-181.000.

Kljuev, Mikhail Markovich: *See—*
Paton, Boris Evgenievich; Latash, Jury Vadimovich; Medovar, Boris Izrailevich; Emelianenko, July Georgievich; and Kljuev, Mikhail Markovich, 3,945,818.

Kloetzer, Wilhelm: *See—*
Brossi, Arnold; Kloetzer, Wilhelm; and Teitel, Sidney, 3,946,041.

Klotzbach, Kurt: *See—*
Strauss, Gottfried; and Klotzbach, Kurt, 3,945,278.

Kmetz, Allan R.: *See—*
Hartsell, Glenn A.; and Kmetz, Allan R., 3,946,421.

Knapp, Heinrich, to Robert Bosch GmbH. Process for the detoxification of exhaust gases. 3,945,204, Cl. 60-274.000.

Knopp, Arthur Albert, to Harris-Intertype Corporation. Hopper loader. 3,945,633, Cl. 271-3.100.

Knoth, Wayne, to Universal Forest Products, Inc. Testing apparatus for structural members. 3,945,249, Cl. 73-94.000.

Knudson, Gary L., to Anaconda Company, The. Split bit casing drill. 3,945,444, Cl. 175-92.000.

Kobayashi, Fujio: *See—*
Nagai, Hidetaka; Sato, Eiichi; and Kobayashi, Fujio, 3,946,105.

Kobayashi, Haruo; Asajima, Takenori; and Narita, Yoshihiro, to Idemitsu Kosan Company Limited. Polycarbonate resin compositions with improved transparency. 3,945,979, Cl. 260-37.0PC.

Kobayashi, Hiroo: *See—*
Ito, Yoshio; Takahashi, Toru; Ishihara, Takayuki; Kobayashi, Hiroo; and Matsuoka, Atsushi, 3,945,726.

Kobayashi, Masaru: *See—*
Hosoda, Kiyoshi; Yamauchi, Teruo; and Kobayashi, Masaru, 3,945,166.

Kobe Steel, Ltd.: *See—*
Kaneko, Fuminori; Ureshino, Kashirou; and Tomita, Masahiro, 3,945,577.

Koch, Victor C. Tube fastening-joint assembly. 3,945,743, Cl. 403-290.000.

Kockler, Barry C.; Johnson, Robert A.; and Leinberger, Merton C., to Xerox Corporation. Method for visually adjusting a pinch roll for magnetic card transport system. 3,945,636, Cl. 271-274.000.

Koebner, Adolf. Sulfonation of aromatic compounds. 3,946,037, Cl. 260-329.00S.

Koehring Company: *See—*
Bishop, Thomas G., 3,945,786.
Koei Chemical Co., Ltd.: *See—*
Minato, Yoshizo; and Nishikawa, Shikibu, 3,946,020.
Koellmann, Hans-Josef: *See—*
Hohorst, Wolfgang; and Koellmann, Hans-Josef, 3,945,711.
Koenig, Wilfried G.; Makris, James S.; and Masters, Burton J., to International Business Machines Corporation. Method of ion implantation through an electrically insulative material. 3,945,856, Cl. 148-1.500.
Koerber, George G.: *See—*
Day, Clifford K.; and Koerber, George G., 3,946,256.
Koezuka, Yokichi: *See—*
Tomioka, Shozo; Matsushima, Shujiro; Koezuka, Yokichi; Tanabe, Geniti; and Nakasyo, Koichi, 3,945,230.
Kogyo Gijutsuin: *See—*
Tarui, Yasuo; and Hayashi, Yutaka, 3,946,424.
Kokusai Denwa Kabushiki Kaisha: *See—*
Miya, Kenichi, 3,946,169.
Kolb, Ernst. Animal feed composition containing certain vitamin combinations. 3,946,109, Cl. 424-95.000.
Komberec, Harold L.; and Kilcup, Dillon K. Vertical baler. 3,945,313, Cl. 100-34.000.
Kondo, Asaji: *See—*
Yazawa, Kenichiro; Kishimoto, Shinzo; Miyano, Shizuo; and Kondo, Asaji, 3,945,830.
Kondo, Keiichi: *See—*
Koto, Noriaki; Kondo, Keiichi; and Okada, Naotake, 3,946,093.
Kondo, Kikuo: *See—*
Matsumoto, Fukuo; Kondo, Kikuo; and Shibata, Masao, 3,945,222.
Konno, Ryozo: *See—*
Sumita, Masujiro; Konno, Ryozo; and Takeuchi, Toru, 3,945,833.
Koo, Bonny B. Spring lift for shoes. 3,945,136, Cl. 36-38.000.
Kordesch, Karl V.; and Kozawa, Akiya, to Union Carbide Corporation. Coherent manganese dioxide electrodes, process for their production, and electrochemical cells utilizing them. 3,945,847, Cl. 136-100.00R.
Kosa, Yasunobu: *See—*
Shoji, Senji; Yasunari, Kenjiro; and Kosa, Yasunobu, 3,946,425.
Kosaka, Shin: *See—*
Nakamura, Minoru; and Kosaka, Shin, 3,945,185.
Kosanke, Johannes, to Continental Gummi-Werke Aktiengesellschaft. Arrangement for securing the beads of a pneumatic tire in the rim therefor. 3,945,419, Cl. 152-339.000.
Kosfeld, Milton M., to Fedders Corporation. Injection cooling arrangement for rotary compressor. 3,945,220, Cl. 62-505.000.
Kossiakoff, Alexander; and Austin, James R., to United States of America, Navy. Search radar adaptive video processor. 3,946,382, Cl. 343-5.0DP.
Kotlar, Edward A. Method and apparatus for making a sheet metal pulley. 3,945,102, Cl. 29-159.00R.
Koto, Noriaki; Kondo, Keiichi; and Okada, Naotake, to Nissan Chemical Industries, Ltd. Process for preparing polyphosphonate. 3,946,093, Cl. 260-973.000.
Koula, Zdenek, to Stotz & Co. Vacuum vaporization apparatus for heating one or a number of separate liquids. 3,945,433, Cl. 165-39.000.
Koury, Frederic: *See—*
Keeffe, William M.; and Koury, Frederic, 3,946,262.
Kovacev, Milan: *See—*
Zodrow, Bernhard; Kovacev, Milan; Stengritt, Wolf Dietrich; and Hopp, Rudolf, 3,945,466.
Kovacs, Sandor: *See—*
Enody, Emil; Kovacs, Sandor; Gelanyi, Istvan; Karoly, Bela; and Kacsmarek, Bela, 3,945,072.
Kovalick, Albert W.; and Scholz, Kenneth D., to Hewlett-Packard Company. Power regulator with R.M.S. output voltage as function of unregulated D.C. 3,946,302, Cl. 323-19.000.
Kowa Company, Ltd.: *See—*
Nagai, Hidetaka; Sato, Eiichi; and Kobayashi, Fujio, 3,946,105.
Kowalski, Frank, deceased; and Kowalski, Helene Bober, executrix. Dual flush toilets. 3,945,056, Cl. 4-67.00A.
Kowalski, Helene Bober, executrix: *See—*
Kowalski, Frank, deceased; and Kowalski, Helene Bober, executrix, 3,945,056.
Koyama, Mitsuo: *See—*
Onda, Eiichi; Koyama, Mitsuo; and Nakagawa, Tadashi, 3,946,413.
Koyanagi, Shunichi; Kitamura, Hajime; and Shimizu, Toshihide, to Shinetsu Chemical Company. Method for suspension-polymerizing vinyl chloride. 3,945,958, Cl. 260-17.00A.
Kozawa, Akiya: *See—*
Kordesch, Karl V.; and Kozawa, Akiya, 3,945,847.
Kozuma, Noboru: *See—*
Nishizawa, Jun-ichi; Sasaki, Ichiemon; Ishida, Katsuhiko; Tauchi, Syoji; Nishimura, Takeshi; Seki, Takeo; and Kozuma, Noboru, 3,946,270.
Kramer, George M.: *See—*
Leder, Frederic; Kramer, George M.; and Solomon, Herman J., 3,946,088.
Krapukhin, Viktor Mikhailovich: *See—*
Milman, Boris Samoilovich; Mirzoian, Genrikh Sergeevich; Strizhov, Gennady Sergeevich; Tinyakov, Viktor Gurievich; Doroschenko, Pavel Petrovich; Karsaky, Vladimir Evgenievich; Levin, Moisei Markovich; Krapukhin, Viktor Mikhailovich; and Semenov, Pavel Vladimirovich, 3,945,427.
Kratz, David W. Boat docking device. 3,945,335, Cl. 114-221.00R.
Kraus, Edmund J.: *See—*
Kraus, Robert A.; and Kraus, Edmund J., 3,945,704.
Kraus, Robert A.; and Kraus, Edmund J. Device for detecting an applied compressive load. 3,945,704, Cl. 339-97.00C.
Krause, Alfred Walter Joachim, deceased (y Krause, Ilse, heiress), to Ruthner Industrieanlagen-Aktiengesellschaft. Control system for hydraulic presses comprising a plurality of press rams. 3,945,206, Cl. 60-374.000.
Krause, Ilse, heiress: *See—*
Krause, Alfred Walter Joachim, deceased, 3,945,206.
Krauss und Reichert: *See—*
Boehme, Dietrich; Hahn, Gunter; Schumann, Gunter; Wienen, Walter; and Jung, Rolf, 3,945,279.
Krautsack, Richard G., to Cooperative Marketing Co., The. Holders having foldable sheet support. 3,945,559, Cl. 229-38.000.
Krei, Joyce Ruth: *See—*
Winn, Martin; Razdan, Raj Kumar; Dalzell, Haldean Cloyce; and Krei, Joyce Ruth, 3,946,111.
Kreitz, Lloyd D. Dust collector for radial arm saws. 3,945,281, Cl. 83-100.000.
Krenzer, John: *See—*
Richter, Sidney B.; and Krenzer, John, 3,946,043.
Richter, Sidney B.; and Krenzer, John, 3,946,044.
Richter, Sidney B.; and Krenzer, John, 3,946,045.
Kressel, Henry: *See—*
Hawrylo, Frank Zygmunt; and Kressel, Henry, 3,945,902.
Kresta, Erich: *See—*
Gorter, Werner; Kresta, Erich; and Stumpf, Horst, 3,945,420.
Kristoff, Basil L.: *See—*
Dabney, William C.; Kristoff, Basil L.; Tuseth, Robert D.; and Hink, John H., 3,945,380.
Krol, Harry J., to King-Koral, Inc. Heavy duty fastener and method of manufacturing same. 3,945,293, Cl. 85-49.000.
Krolik, Kenneth J., to Motorola, Inc. Combined encoder-decoder apparatus having a single active filter. 3,946,313, Cl. 325-18.000.
Krolik, Kenneth J., to Motorola, Inc. Digital encoder. 3,946,321, Cl. 328-25.000.
Kronner, Richard F. Hip pinning tool. 3,945,377, Cl. 128-92.0EB.
Kroy, Walter: *See—*
Erben, Klaus Dieter; Kroy, Walter; and Mehnert, Walter Erich, 3,946,233.
Krueger Metal Products, Inc.: *See—*
Hendrickson, Philip J.; and Resch, Richard J., 3,945,328.
Ku, San-Mei: *See—*
Jacobus, William N., Jr.; and Ku, San-Mei, 3,946,417.
Kubbetat, Wolfgang: *See—*
Mallwitz, Detlef; Klingner, Hartmut; and Kubbetat, Wolfgang, 3,945,600.
Kucharski, Leonard J.: *See—*
Votta, Gerald A.; and Kucharski, Leonard J., 3,946,180.
Kuehnegger, Walter, to Otto Bock Orthopedic Industry, Inc. Orthopedic brace (orthesis). 3,945,376, Cl. 128-78.000.
Kuerten, Heribert: *See—*
Horn, Peter; and Kuerten, Heribert, 3,945,969.
Kuffner, Karl: *See—*
Zorn, Hugo; Kuffner, Karl; Glockner, Hans; Willems, Jozef Frans; and Thiers, Robrecht Julius, 3,945,829.
Kuhfus, Gerd, to Northern Electric Company, Limited. Multiple push-button switch assembly for telephone sets and the like. 3,946,171, Cl. 200-5.00R.
Kuhn, Karl Walter, to Societe d'Etudes de Machines Thermiques. Cooled exhaust valve and methods of manufacture thereof. 3,945,356, Cl. 123-41.410.
Kulikowski, Donald F.: *See—*
Ostrem, Obert M.; and Kulikowski, Donald F., 3,945,334.
Kunert, Maximilian; and Wegner, Hans-Georg, to Deutsche Texaco Aktiengesellschaft. Urea dewaxing of low n-paraffin content oils. 3,945,912, Cl. 208-25.000.
Kurisu, Katsuyasu: *See—*
Suzuki, Kunihiko; and Kurisu, Katsuyasu, 3,945,458.
Kurita, Toshio: *See—*
Kanetsuna, Hisaaki; and Kurita, Toshio, 3,946,094.
Kuroda, Hiroshi: *See—*
Takemoto, Toyoki; and Kuroda, Hiroshi, 3,945,347.
Kurosaki, Teikichi: *See—*
Takino, Masuichi; Kurosaki, Teikichi; and Odaka, Munehiko, 3,946,012.
Kusters, Eduard; and Quoos, Kurt, to Kusters, Eduard. Web drying apparatus. 3,945,131, Cl. 34-122.000.
Kwiatek, Jack; Murib, Jawad H.; and Brush, Charles K., to National Distillers and Chemical Corporation. Process for the preparation of aromatic aldehydes. 3,946,067, Cl. 260-476.00R.
Kyowa Hakko Kogyo Co., Ltd: *See—*
Fujimoto, Yasuo; Tatsukawa, Keizo; Nagaoka, Koichi; Nagumo, Masayuki; and Nagai, Kiichi, 3,945,952.
Kyser, Edmond L.; and Sears, Stephan B., to Silonics, Inc. Method and apparatus for recording with writing fluids and drop projection means therefor. 3,946,398, Cl. 346-1.000.

L. A. Emergency Oxygen, Inc.: *See—*
Cipres, Henry A., 3,945,667.

L Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude: *See—*
Boulenger, Paul, 3,945,916.

Labaz: *See—*
Descamps, Margel; and Inion, Henri, 3,946,029.

Labus, Herwig, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Bearing and bearing support for rotary piston engine for compressing and expanding gases. 3,945,777, Cl. 418-188.000.

Lahm, Heinrich, to Index-Werke KG Hahn & Tessky. Method and apparatus for checking and monitoring the accuracy of the movement of the carriage of a machine tool responsive to a predetermined operating program. 3,946,296, Cl. 318-563.000.

Lahut, Joseph A.: *See—*
Berkowitz, Ami E.; and Lahut, Joseph A., 3,946,404.

Laird, James A.: *See—*
Tung, Chi Fang; and Laird, James A., 3,946,130.

Lam, Tim Yee: *See—*
Saper, Barry M.; and Lam, Tim Yee, 3,946,310.

Lambert, Howard J.: *See—*
Chien, Yie W.; and Lambert, Howard J., 3,946,106.

Lampe, Hans Hermann: *See—*
Hahn, Guenter; Lampe, Hans Hermann; and Rudolph, Peter, 3,946,378.

Lampinen, Wesley. Article supporting device. 3,945,498, Cl. 211-60.00R.

Landis, James P., to Pillar Corporation. High frequency power supply. 3,946,300, Cl. 321-8.00C.

Landsman, Robert M., to LogEtronics, Inc. Printing plate blank and image sheet by laser transfer. 3,945,318, Cl. 101-467.000.

Landwehrkamp, Hans; and Niestroj, Heinz, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Method and apparatus for starting a thread in open-end spinning devices. 3,945,183, Cl. 57-34.00R.

Lanfermann, Willy: *See—*
Henrich, Friedhelm; and Lanfermann, Willy, 3,945,680.

Lang, Rudolf F.: *See—*
Buckman, Stanley J.; Lang, Rudolf F.; and Mishler, Michael L., 3,946,061.

Lange, Daniel J., to P. D. George Co., The. Oil modified imidized polyester resins. 3,945,959, Cl. 260-20.000.

Lange, George M.; and Pierce, Walter C. Zero current switching circuitry. 3,946,277, Cl. 317-11.00A.

Langen & Co.: *See—*
Strauff, Gunther, 3,945,456.

Langen, Peter. Discharge device for a bunker. 3,945,537, Cl. 222-240.000.

Langer, Erich, to U.S. Philips Corporation. Recording and playback apparatus. 3,946,435, Cl. 360-14.000.

LaPaglia, Samuel A.: *See—*
Harendza-Harinxma, Alfred J., 3,946,101.

Larsen, Richard J.; and Mitchell, Robert W., to Hitco. Method and apparatus for producing high modulus bixial fabric. 3,945,093, Cl. 26-68.000.

Larson, Larry K.: *See—*
Walker, Charles W.; and Larson, Larry K., 3,945,544.

Lartigau, Guy: *See—*
Billet, Lucien; and Lartigau, Guy, 3,946,070.

Lassau, Christian: *See—*
Hillion, Gerard; and Lassau, Christian, 3,946,087.

Latash, Jury Vadimovich: *See—*
Paton, Boris Evgenievich; Latash, Jury Vadimovich; Medovar, Boris Izrailevich; Emelianenko, July Georgievich; and Kljuev, Mikhail Markovich, 3,945,818.

Latrobe Steel Company: *See—*
Stroup, James P., 3,945,821.

Laufer, Helmut, to Robert Bosch GmbH. RPM Regulator for fuel injection pumps. 3,945,360, Cl. 123-139.0AD.

Lauro, Luciano: *See—*
Pomella, Piero; Lauro, Luciano; and Scotti, Pier Gianni, 3,946,189.

Lauterbach, George E.: *See—*
Holty, David W.; and Lauterbach, George E., 3,945,843.

LaWhite, Eric: *See—*
Tweed, David G.; and LaWhite, Eric, 3,945,373.

Lawrence Peska Associates, Inc.: *See—*
Allocco, Andrew, Jr., 3,945,059.

Lazaroff, Gary G. Garment hanger. 3,945,543, Cl. 223-88.000.

Leatherman, Alfred F.: *See—*
Heller, William C., Jr.; and Leatherman, Alfred F., 3,945,867.

Leavitt, Chaim; Alper, Yekutiel; and Gruenewald, Tzvi, to State of Israel Ministry of Agriculture, The. Seed planting unit. 3,945,330, Cl. 111-1.000.

Le Bihan, Herve: *See—*
Darredeau, Bernard; Cappiello, Pierre; and Le Bihan, Herve, 3,945,214.

Leclercq, Marc A.; Poirier, Alain M.; and Guichard, Jacques M. Video-telephone system initially signifies caller to called subscriber. 3,946,158, Cl. 179-2.0TV.

Ledebur, Harry C., to Wean United Inc. Tractive apparatus. 3,945,547, Cl. 226-172.000.

Leder, Frederic; Kramer, George M.; and Solomon, Herman J., to Exxon Research & Engineering Co. Hydrocarbon isomerization process. 3,946,088, Cl. 260-683.750.

Lee, Leonard S.; Siegel, Howard M.; and Sopp, Samuel W., to Merck & Co., Inc. Coated ferrous substrates comprising an amorphous magnesia-silica complex. 3,945,862, Cl. 148-31.500.

Lee, Richard M., to Westinghouse Electric Corporation. Cooling system for a gas turbine. 3,945,758, Cl. 415-144.000.

Leeds & Northrup Company: *See—*
Jenkins, Theron W., Jr., 3,946,211.

Leftheris, Basil P., to Grumman Aerospace Corporation. Method and apparatus for driving interference-fit fasteners. 3,945,109, Cl. 29-525.000.

Leicht, Werner, to Motoren-und Turbinen-Union Friedrichshafen GmbH. Hydraulic guide-wheel adjusting mechanism. 3,945,762, Cl. 417-18.000.

Leidich, Arthur John, to RCA Corporation. Transistor amplifier. 3,946,325, Cl. 330-22.000.

Leinberger, Merton C.: *See—*
Kockler, Barry C.; Johnson, Robert A.; and Leinberger, Merton C., 3,945,636.

Leiste, Hans Peter; and Eckardt, Helmut, to Schloemann-Siemag Aktiengesellschaft. Injection molding apparatus. 3,945,535, Cl. 222-146.0HE.

Leliaert, Raymond M., to Wheelabrator-Frye, Inc. Method of removing ice from a surface by blasting. 3,945,155, Cl. 51-319.000.

LeMasurier, Philip Howard: *See—*
Mouat, Thomas W.; and LeMasurier, Philip Howard, 3,945,125.

Lemercier, Guy, to Commissariat a l'Energie Atomique. Heat-insulating system for a fast reactor shield slab. 3,945,165, Cl. 52-406.000.

Lemercier, Guy, to Commissariat a l'Energie Atomique. Heat-insulating lining for a fast reactor. 3,945,887, Cl. 176-87.000.

Lenk, Erich: *See—*
Schippers, Heinz; and Lenk, Erich, 3,945,579.
Schippers, Heinz; and Lenk, Erich, 3,945,581.

Lennox Industries, Inc.: *See—*
Parker, Sidney A., 3,945,218.

Leowald, Karl-Friedrich: *See—*
Habock, Adolf; Beckmann, Oskar; Frese, Stefan; Radda, Herbert; Mayerhofer, Franz; and Leowald, Karl-Friedrich, 3,946,389.

Leroy, Georges: *See—*
Delaunois, Yvon; Hestermans, Pierre; Leroy, Georges; Peerts, Fernand; and Wilante, Claude, 3,946,083.

Leshem, Adam, to Combustion Engineering, Inc. Gripper type linear motion device. 3,946,258, Cl. 310-14.000.

Leushkin, Vadim Nikolaevich: *See—*
Yascheritsyn, Petr Ivanovich; Golant, Jury Khonanovich; Leushkin, Vadim Nikolaevich; Mironov, Gennady Mikhailovich; Minakov, Anatoly Petrovich; and Bogachev, Viktor Vladimirovich, 3,945,098.

Level-Line Products: *See—*
Spier, I. Martin; and Arbib, Richard H., 3,945,599.

Lever Brothers Company: *See—*
Scharp, Jacob Arie, 3,946,122.

Leveskis, Newton G., to Argus Chemical Corporation. Preparation of aldehyde and ketone organic peroxide compositions. 3,945,940, Cl. 252-186.000.

Levin, Moisei Markovich: *See—*
Milman, Boris Samoilovich; Mirzoian, Genrikh Sergeevich; Strizhov, Gennady Sergeevich; Tinyakov, Viktor Gurievich; Doroschenko, Pavel Petrovich; Karsaky, Vladimir Evgenievich; Levin, Moisei Markovich; Krapukhin, Viktor Mikhailovich; and Semenov, Pavel Vladimirovich, 3,945,427.

Levine, Morris; Yurcheshen, Michael; and Hight, Roland W., to PPG Industries, Inc. Water-based epoxy acrylic coating compositions. 3,945,963, Cl. 260-29.6NR.

Levine, Nathan; and Levinson, Eric Leon. Cloth forming jigs for use in the manufacture of clothing. 3,945,541, Cl. 223-38.000.

Levinson, David W.: *See—*
Friedman, Howard; Levinson, David W.; and Millman, Morris H., 3,945,826.

Levinson, Eric Leon: *See—*
Levine, Nathan; and Levinson, Eric Leon, 3,945,541.

Leviton Manufacturing Co., Inc.: *See—*
Poliak, John M.; and Lopez, Juan M., 3,945,702.

Levitz Furniture Corporation: *See—*
Levitz, Ralph, 3,945,467.

Levitz, Ralph, to Levitz Furniture Corporation. Retail furniture display and sales facility. 3,945,467, Cl. 186-1.00R.

Lewis, Richard Walter, to Timex Corporation. Plastic cased primary cell sheathed in a split metal case. 3,945,850, Cl. 136-107.000.

Liakumovich, Alexandr Grigorievich: *See—*
Gershanov, Felix Borisovich; Liakumovich, Alexandr Grigorievich; Michurov, Jury Ivanovich; Pantukh, Boris Izrailevich; Rutman, Grigory Iosifovich; Sobolev, Valerian Mikhailovich; Grinberg, Alexandr Afroimovich; Gurvich, Yakov Abramovich; Zakharova, Nina Vasilievna; and Nafikova, Almira Mudarisovna, 3,946,086.

Licentia Patent- Verwaltungs- G.m.b.H.: *See—*
Minner, Willy; and Muller, Jorn, 3,946,326.

Liebig, William J., to Meadox Medicals, Inc. Synthetic vascular graft and method for manufacturing the same. 3,945,052, Cl. 3-1.000.

Liechti, Hans Wilhelm: *See—*
Angliker, Hans-Jorg; Peter, Richard; and Liechti, Hans Wilhelm, 3,945,989.
Ramanathan, Visvanathan; and Liechti, Hans Wilhelm, 3,945,991.

Lilly Industries Limited: *See—*
Davison, Michael; Frankham, David Binfield; and Spence, Thomas William Matches, 3,946,002.

Lindberg, Arthur F., to Teletype Corporation. Resiliently mounted drive nut and carriage assembly. 3,945,481, Cl. 197-90.000.

Lindemann Maschinenfabrik GmbH: *See—*
Dahlem, Peter; and Milles, Hubert, 3,945,315.

Linden, Sven-Erik; and Schalling, Hans Erik Otto, to Elektriska Svetsningsaktiebolaget. Chain making apparatus. 3,945,198, Cl. 59-16.000.

Lindenbaum, Ben. Foolproof coin and key retainer. 3,945,491, Cl. 206-.810.

Lion Fat & Oil Co., Ltd.: *See—*
Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Nagayama, Masuzo, 3,946,055.

Lippman, Michael David, to RCA Corporation. Serial to parallel converter for data transmission. 3,946,379, Cl. 340-347.0DD.

Listov, Petr Nikolaevich; Ganiev, Madzhid Saidovich; Buromsky, Vladimir Ivanovich; Bogdanova, Lidia Ivanovna; Kalafatov, Enver Tefikovich; Topalidi, Dmitry Nikolaevich; Rodionov, Vitaly Petrovich; Junusov, Edem Idrisovich; and Fedorov, Valery Pavlovich. Cotton pickup. 3,945,179, Cl. 56-28.000.

Liu, Arnold E.: *See—*
Liu, Frederick F.; and Liu, Arnold E., 3,945,253.

Liu, Frederick F.; and Liu, Arnold E. Apparatus and method for measuring fluid flow over a wide range of fluid flow conditions and viscosities. 3,945,253, Cl. 73-231.00R.

Livgren, Allen L.: *See—*
Rudder, Walter H.; Braden, William D., deceased; McEvoy, Charles J.; Dodson, Stokes R., Jr.; Thiele, John R.; and Livgren, Allen L., 3,945,866.

LKB-Produkter AB: *See—*
Forsstrom, Bo Gosta, 3,945,412.

Llona, Jesus Gomez; and Melendo, Sabino de Bernedo, to Arteche, Instrumentacion Y Sistemas Electronicos, S.A. Overcurrent protection system with variable inverse-time characteristic. 3,946,281, Cl. 317-36.0TD.

Lloyd, Thomas C.: *See—*
Brown, Wallace G.; and Lloyd, Thomas C., 3,946,146.

Lobeck, Walter G., Jr.: *See—*
Wu, Yao Hua; and Lobeck, Walter G., Jr., 3,946,004.

Lobo, Alfred D. Protective garment for skaters, and the like. 3,945,042, Cl. 2-2.000.

Lodding Engineering Corporation: *See—*
Speidel, Thomas O. P., 3,945,881.

Lodige, Fritz: *See—*
Lodige, Wilheim; Lodige, Fritz; and Lucke, Josef, 3,945,616.

Lodige, Wilheim; Lodige, Fritz; and Lucke, Josef. Device for mixing flowable material such as adhesive with particulate material. 3,945,616, Cl. 259-9.000.

LogEtronics, Inc.: *See—*
Landsman, Robert M., 3,945,318.

Long, Charles Frederick: *See—*
Walker, Andrew; Long, Charles Frederick; and Birks, Harry Davies, 3,945,426.

Lopez, Juan M.: *See—*
Poliak, John M.; and Lopez, Juan M., 3,945,702.

L'Oreal: *See—*
Jacquet, Bernard; Papantoniou, Christos; Dufaure, Pierre; and Mahieux, Claude, 3,946,035.

Louzecky, Paul J., to General Motors Corporation. Rotary combustion engine damped apex seal. 3,945,775, Cl. 418-113.000.

Love, Roger R., to Computer Power, Inc. Direct current to alternating current electronic inverter with overload and short-circuit protection circuitry. 3,946,301, Cl. 321-11.000.

Lowrance Electronics, Inc.: *See—*
Moore, John C., 3,946,295.

Lowy, Avigdor: *See—*
Popper, Jakhin Boas; and Lowy, Avigdor, 3,945,324.

Lucas Electrical Company Limited: *See—*
Mosby, Geoffrey Ralph, 3,945,492.

Lucas, Malcolm Bramel; McKenna, James Francis; and Diehl, Francis Louvaine, to Procter & Gamble Company, The. Bleaching article. 3,945,936, Cl. 252-95.000.

Lucas, Richard K., to Veeder Industries, Inc. Multiple purpose electronic counting system. 3,946,219, Cl. 235-159.000.

Lucke, Josef: *See—*
Lodige, Wilheim; Lodige, Fritz; and Lucke, Josef, 3,945,616.

Luebkeman, Hart H. Basketball practice net. 3,945,638, Cl. 273-1.50A.

LuK Lamellen und Kupplungsbau GmbH: *See—*
Maucher, Paul; and Dubiel, Oswald, 3,945,477.

Lukes, Jerome A.; and Schroeder, Robert P., to Erco Envirotech Ltd. Sodium chloride removal in pulp mill systems. 3,945,880, Cl. 162-17.000.

Lukkarinen, Viljo: *See—*
Kinnunen, Paavo; and Lukkarinen, Viljo, 3,946,286.

Lumenition Limited: *See—*
Ford, Eric Harold, 3,945,350.

Lummus Company, The: *See—*
Tsao, Utah, 3,946,114.

Lunde, George G., to Minnesota Mining & Manufacturing Company. Toner applicator for electrographic recording system. 3,946,402, Cl. 346-74.0ES.

Lustig, Claude D.; and Thaxter, James B., to Sperry Rand Corporation. Plural filter system cooperating with cathode ray display with lanthanum host phosphor emissive in two colors. 3,946,267, Cl. 313-473.000.

Lyemance, Bentford C. Chimney damper arrangement. 3,945,307, Cl. 98-60.000.

Lynch, John F.; and Waeldner, William J., to Anemostat Products Division Dynamics Corporation of America. System powered actuating means for butterfly type damper. 3,945,565, Cl. 236-49.000.

Lyons, Dianne D.; and Chandler, William R. Device for branding indicia on a tennis ball. 3,946,195, Cl. 219-216.000.

Ma, John; and Tanaka, Akio, to Zenith Radio Corporation. All electronic digital tuner system with memory. 3,946,319, Cl. 325-459.000.

Maag Gear-Wheel & Machine Company Limited: *See—*
Bloch, Peter, 3,945,126.

Machlett Laboratories, Inc., The: *See—*
Holland, William P.; Swanson, Capleton I.; and Randmer, Jacob A., 3,946,261.

MacKenzie, Burton Thornley, Jr., to General Electric Company. Pressureless cure system for chemically cross-linking ethylene containing polymers, to form an insulated conductor. 3,946,099, Cl. 264-174.000.

MacMaster, George H.; and Dudley, Kenneth W., to Raytheon Company. Microwave browning utensil. 3,946,187, Cl. 219-10.55E.

Maddox, Jim, Jr.: *See—*
Shupe, Russell D.; Maddox, Jim, Jr.; and Tate, Jack F., 3,945,439.
Tate, Jack F.; Maddox, Jim, Jr.; and Shupe, Russell D., 3,945,438.

Maeder, Arthur: *See—*
Nachbur, Hermann; and Maeder, Arthur, 3,946,092.

Maglio, Melvin R., Jr. Anti-tank missile. 3,945,588, Cl. 244-3.160.

Magnavox Company, The: *See—*
Caspari, Fred W., 3,946,329.
Smith, Valor C.; Gantsweg, Marvin; and Faigen, Ivan M., 3,946,396.

Mahieux, Claude: *See—*
Jacquet, Bernard; Papantoniou, Christos; Dufaure, Pierre; and Mahieux, Claude, 3,946,035.

Mahle GmbH: *See—*
Hannig, Christoph, 3,945,423.

Maico Hearing Instruments Inc.: *See—*
Preves, David A., 3,946,168.

Maida, Osamu, to Nippon Kogaku K.K. Electromagnetic trigger device. 3,946,410, Cl. 354-173.000.

Maillefer S.A.: *See—*
Veyrassat, Louis, 3,945,580.

Maki, Mamoru: *See—*
Hagiya, Keiichi; Maki, Mamoru; Ogawa, Hiroshi; Hachiya, Takeo; and Ochiai, Kiyozo, 3,945,754.

Makino, Kazutaka: *See—*
Iinoya, Koichi; and Makino, Kazutaka, 3,945,813.

Makris, James S.: *See—*
Koenig, Wilfried G.; Makris, James S.; and Masters, Burton J., 3,945,856.

Malinowski, William J., to Pyrotector, Incorporated. Light detector with pulsed light source and synchronous data gating. 3,946,241, Cl. 250-574.000.

Mallett, A. J.: *See—*
Weinstein, David Harold; Ashworth, Monroe Alfred, III; and Mallett, A. J., 3,946,357.

Mallwitz, Detlef; Klingner, Hartmut; and Kubbetat, Wolfgang, to Spindler & Hoyer KG Werk fur Feinmechanik und Optik. Multidimensional apparatus for mounting laboratory and experimenting equipment and/or for additionally mounting optical elements. 3,945,600, Cl. 248-466.000.

Malot, Andre, to Creusot-Loire. Boring machine for work pieces of large diameter. 3,945,750, Cl. 408-117.000.

Malpass, Dennis B.; Heilig, George Charles; and Foley, Thomas C., to Texas Alkyls, Inc. Process for recovering of dialkylaluminum halide from mixtures containing soluble zinc. 3,946,058, Cl. 260-448.00A.

Malton Electric Company: *See—*
Bozich, Robert A., 3,945,530.

Mangan, Clifford, to Ilford Limited. Film cassettes. 3,945,584, Cl. 242-71.100.

Manigault, Edward L., to N L Industries, Inc. Alumina refractory. 3,945,839, Cl. 106-66.000.

Manko, Howard H., to Alpha Metals, Inc. Functional alloy for use in automated soldering processes. 3,945,556, Cl. 228-263.000.

Mantchev, Marco Ivanov. Valvular liquid dispensing closure. 3,945,540, Cl. 222-525.000.

Mao, Chung-Ling; and Bakker, Lynn A., to Uniroyal, Inc. N,N'-bis(1,1-dioxohydrothienyl)diaminoalkanes. 3,946,038, Cl. 260-330.500.

Marathon-LeTourneau Company: *See—*
Wilson, Clyde H.; Cross, Donald M.; Dupuy, James A.; and Tarrant, Duel J., 3,945,450.

Marcel, Jean Pierre. Rotary sliding partition machine with fluid chambers at the partition ends. 3,945,780, Cl. 418-232.000.

Marcozzi, Arthur J., to United States Steel Corporation. Cross linkable thermoplastic adhesives. 3,945,877, Cl. 156-332.000.

Mardla, Ilmar: *See—*
Jysky, Goran; Mardla, Ilmar; and Ericsson, Bjorn, 3,945,613.

Marek, James R.: *See—*
Bronikowski, Raymond J.; Marek, James R.; and Barger, John L., 3,946,351.

Margotte, Dieter; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Flame-resistant polycarbonate molding compositions. 3,946,090, Cl. 260-857.00R.

Marheine, Edward A., to GTE Automatic Electric Laboratories Incorporated. Three motor tape drive mechanism. 3,946,291, Cl. 318-7.000.

Marietta, James W., Jr.; and Tipper, Maynard J. G., to Marietta, James W., Jr. Food packaging apparatus. 3,945,171, Cl. 53-79.000.

Marietta, Walter E., to Parker-Hannifin Corporation. Variable displacement pump control assembly. 3,945,764, Cl. 417-212.000.

Marin, Mario J., to Pitney-Bowes, Inc. Power stacker. 3,945,635, Cl. 271-202.000.

Marino, Francis C., to Redactron Corporation. Binary switching video amplifier. 3,946,275, Cl. 315-383.000.

Marino, Salvatore M.: *See*—
Osterkorn, Charles Louis; and Marino, Salvatore M., 3,945,554.

Marion, Charles P.; and Reynolds, Blake, to Texaco Development Corporation. Fuel burner and process for gas manufacture. 3,945,942, Cl. 252-373.000.

Marion, Frank A.; and McSpadden, Hugh J., to Universal Propulsion Co. Rocket containing lead oxidizer salt-high density propellant. 3,945,202, Cl. 60-253.000.

Markley, Raymond L.: *See*—
Milan, Albert R.; and Markley, Raymond L., 3,945,372.

Marks, David Alex, to Transmatic Fyllan Limited. Metering device for flowable materials. 3,945,532, Cl. 222-55.000.

Marksberry, Clarence L.: *See*—
Parker, Kenneth O.; and Marksberry, Clarence L., 3,945,434.

Marley, Robert R., to Motorola, Inc. Fully compensated emitter coupled logic gate. 3,946,246, Cl. 307-218.000.

Marraccini, Franco, to Ing. C. Olivetti & Co., S.p.A. Support for fixing objects removably. 3,945,596, Cl. 248-311.00R.

Marsh, Paul G., to Black Clawson Fibreclaim Inc. Recovery of salvageable components from waste materials. 3,945,575, Cl. 241-20.000.

Martin, Fred David, to Calgon Corporation. Process for the secondary or tertiary recovery of petroleum. 3,945,929, Cl. 252-8.55D.

Martin Marietta Corporation: *See*—
Precht, Walter, 3,945,863.

Martin, Sylvia; Creutz, Hans Gerhard; and Becking, Donald Harvey, to Oxy Metal Industries Corporation. Bath composition and method of electrodepositing utilizing the same. 3,945,894, Cl. 204-55.00R.

Martinez, Delbert L.; Martinez, Michael J.; and Martinez, Morris P. Tire chain device. 3,945,162, Cl. 152-213.00R.

Martinez, Michael J.: *See*—
Martinez, Delbert L.; Martinez, Michael J.; and Martinez, Morris P., 3,945,162.

Martinez, Morris P.: *See*—
Martinez, Delbert L.; Martinez, Michael J.; and Martinez, Morris P., 3,945,162.

Marvin Glass & Associates: *See*—
Breslow, Jeffrey D., 3,945,643.

Marx, Claus: *See*—
Ostertag, Alfred; and Marx, Claus, 3,945,446.

Maryland Cup Corporation: *See*—
Mowrey, Melvin, Jr., 3,945,528.

Maryland Grading and Fabricating Company, Inc.: *See*—
Bredbenner, Lee P., 3,945,746.

Maschinenfabrik u.Giesserei Netstal AG: *See*—
Ruegg, Edwin, 3,945,620.

Masheder, Henry. Check valves. 3,945,398, Cl. 137-527.800.

Mason, Daniel W., to Motorola, Inc. Ultra thin electronic watch with improved visibility display. 3,945,195, Cl. 58-23.00R.

Massey-Ferguson Services N.V.: *See*—
Delfosse, Gilbert; and Andiano, Jose, 3,945,178.

Massoletti, Arnold M.: *See*—
Wood, John R.; Morris, James B., Sr.; and Massoletti, Arnold M., 3,945,196.

Masters, Burton J.: *See*—
Koenig, Wilfried G.; Makris, James S.; and Masters, Burton J., 3,945,856.

Masuda, Naosuke; and Yanagawa, Itiro, to Jidosha Kiki Co., Ltd. Combined load-sensing proportion and relay valve. 3,945,689, Cl. 303-22.00R.

Masuda, Naosuke; Yanagawa, Itiro; and Suzuki, Isao, to Jidosha Kiki Co., Ltd. Fluid-pressure regulating valve. 3,945,690, Cl. 303-22.00R.

Matsubara, Hideyuki: *See*—
Nakao, Hisaji; Fukuma, Nobuo; Matsubara, Hideyuki; Takasu, Tadahiro; and Yoneda, Takao, 3,946,212.

Matsubara, Hiroyoshi; Osuka, Tatsumi; and Sugiyama, Tadao, to Nippon Kokan Kabushiki Kaisha. Method of manufacturing steel for low temperature services. 3,945,858, Cl. 148-2.000.

Matsui, Isamu; Sakai, Shoji; Tsukada, Susumu; and Kawarabayashi, Susumu, to Murata Kikai Kabushiki Kaisha. Apparatus for automatic cop feeding. 3,945,488, Cl. 198-249.000.

Matsui, Masanao; Katsube, Junki; Shimomura, Hiromi; and Murayama, Eichi, to Sumitomo Chemical Co., Ltd. Production of cyclopentane derivatives. 3,946,063, Cl. 260-464.000.

Matsui, Takeshi: *See*—
Oishi, Kazuo; Yamada, Takashi; and Matsui, Takeshi, 3,945,459.

Matsumoto, Fukuo; Kondo, Kikuo; and Shibata, Masao, to Toray Textiles, Inc. Apparatus for setting a pattern to a pattern wheel in a circular knitting machine. 3,945,222, Cl. 66-1.00R.

Matsunami, Koichi: *See*—
Furukawa, Kaoru; Tsukamoto, Chiaki; Nagai, Hiroshi; Matsunami, Koichi; and Nagano, Hikoichi, 3,946,089.

Matsuoka, Atsushi: *See*—
Ito, Yoshio; Takahashi, Toru; Ishihara, Takayuki; Kobayashi, Hiroo; and Matsuoka, Atsushi, 3,945,726.

Matsushima, Shujiro: *See*—
Tomioka, Shozo; Matsushima, Shujiro; Koezuka, Yokichi; Tanabe, Geniti; and Nakasyo, Koichi, 3,945,230.

Matsushita Electric Industrial Company, Ltd.: *See*—
Ishimaru, Satoshi; and Nakano, Shoitsu, 3,946,317.
Takemoto, Toyoki; and Kuroda, Hiroshi, 3,945,347.
Yasuda, Masahito, 3,946,289.

Matsushita Electric Industrial Co., Ltd. - Wireless Research Laboratory: *See*—
Nakajima, Yasutaka; Sasaki, Toshiharu; and Katakabe, Noboru, 3,945,727.

Matsushita Electric Works, Ltd.: *See*—
Ohnishi, Kazuaki; and Ohnuki, Katsuhiro, 3,946,380.
Sauer, Hans, 3,946,347.

Matsuura, Takashi, to Matsuura, Takashi; Saito, Tamotsu; and Sato, Tetsuo. Bed and stretcher for an invalid. 3,945,063, Cl. 5-63.000.

Matthews, Roe I. Oxygen supply system for IC engines. 3,945,366, Cl. 123-198.00A.

Maucher, Paul; and Dubiel, Oswald, to LuK Lamellen und Kupplungsbau GmbH. Reversing mechanism for two clutches, especially for motor vehicles such as prime movers, equipment carriers or the like. 3,945,477, Cl. 192-51.000.

Max Kabushiki Kaisha: *See*—
Sato, Tutomu; Horikawa, Kiyomi; Hiroi, Masayoshi; Umino, Shigeyuki; Yamada, Toshio; Takayama, Takashi; and Kayamori, Toru, 3,945,551.

May, Jack L., to Boeing Company, The. Pseudo-random code generator. 3,946,215, Cl. 235-152.000.

Mayer, Cornelius; Diewald, Gunther; and Reber, Heinrich, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Shell and method of manufacturing the same. 3,945,321, Cl. 102-67.000.

Mayer, Franz: *See*—
Fitz, Herbert; and Mayer, Franz, 3,946,136.

Mayerhofer, Franz: *See*—
Habock, Adolf; Beckmann, Oskar; Frese, Stefan; Radda, Herbert; Mayerhofer, Franz; and Leowald, Karl-Friedrich, 3,946,389.

Mayo, James C., Sr.: *See*—
Fritsch, Robert A.; Mayo, James C., Sr.; and Johnson, James N., 3,945,333.

Mayr, Gunter; and Schlaich, Jorg, to Balcke-Durr Aktiengesellschaft. Method of mounting a natural draft cooling tower. 3,945,106, Cl. 29-429.000.

McBride, Maurice Graham; and Gray, Bernard Herbert Leslie, to Sangamo Weston Limited. Electric stepping motors and remote registers. 3,946,259, Cl. 310-49.00R.

McClaughry, Michael J., to Teletype Corporation. Fast-acting feedforward kicker circuit for use with two serially connected inverters. 3,946,245, Cl. 307-205.000.

McClure, Robert Bruce. Biomedical signal processing. 3,945,374, Cl. 128-2.10M.

McCombs, Frank Paul: *See*—
Biefeld, Lawrence P.; Foley, Kevin M.; and McCombs, Frank Paul, 3,946,131.

McCormick, Larry L., to G & H Technology, Inc. Snap action connector. 3,945,703, Cl. 339-89.00M.

McCoy, Lyle E. Continuous textile dyeing apparatus. 3,945,225, Cl. 68-5.00D.

McCurdy, John L.; and Stein, Norman, to Standard Oil Company. Process for producing impact resistant polymer. 3,945,976, Cl. 260-33.6AQ.

McDonald, Paul D. Gate valve. 3,945,606, Cl. 251-326.000.

McDonnell Douglas Corporation: *See*—
Speakman, Eugene R., 3,945,695.

McEvoy, Charles J.: *See*—
Rudder, Walter H.; Braden, William D., deceased; McEvoy, Charles J.; Dodson, Stokes R., Jr.; Thiele, John R.; and Livgren, Allen L., 3,945,866.

McGee, Charles D.; and French, Charles S., to Scott USA. Goggle and accessories therefor. 3,945,044, Cl. 2-14.00H.

McGehee, C. Bernie; Rees, J. Samuel; and Johnson, Luther J., Jr. Tire conditioning and truing apparatus. 3,945,277, Cl. 82-51.000.

McGraw-Edison Company: *See*—
Bronikowski, Raymond J.; Marek, James R.; and Barger, John L., 3,946,351.

McIlrath, William P., to Racine Railroad Products, Inc. Clamping apparatus for supporting a machining device. 3,945,749, Cl. 408-95.000.

McKelvey, Harold E., to Shatterproof Glass Corporation. Cathodes for sputter-coating glass sheets or other substrates. 3,945,911, Cl. 204-298.000.

McKenna, James Francis: *See*—
Lucas, Malcolm Bramel; McKenna, James Francis; and Diehl, Francis Louvaine, 3,945,936.

McKinley, Milton R.: *See*—
Frisbie, Milo W.; and McKinley, Milton R., 3,945,505.

McLoughlin, Robert H., to Raychem Limited. Heat recoverable article for protecting junctions. 3,946,143, Cl. 174-84.00R.

McManus, Lawrence R.: *See*—
Durand, Philip E.; McManus, Lawrence R.; and Claus, William D., Jr., 3,945,122.

McMillan, Robert H., to Arvin Industries, Inc. Muffler with rupture control means. 3,945,460, Cl. 181-61.000.

McMillian, Lonnie S.; and Frohwein, George E., to SCI Systems, Inc. Rate-of-change combustion and contamination detection device. 3,946,374, Cl. 340-237.00S.

McMills, Corey John: *See—*
Siden, Dennis Carl; and McMills, Corey John, 3,945,114.

McMullen, Galen B., to Salminen, Christopher; and Whitsel, Dominick A., part interest to each. Chuck jaw and spindle alignment attachment. 3,945,654, Cl. 279-123.000.

McSpadden, Hugh J.: *See—*
Marion, Frank A.; and McSpadden, Hugh J., 3,945,202.

McVicker, Gary B., to Exxon Research & Engineering Co. Preparation of zerovalent phosphine substituted rhodium compounds and their use in the selective carbonylation of olefins. 3,946,082, Cl. 260-604.0HF.

Meacham, James F.; and Notte, Louis R., to Federal Pacific Electric Company. Panelboard front having concealed clamps. 3,946,283, Cl. 317-120.000.

Meacham, Jeffrey W.: *See—*
Kiovsky, Joseph R.; and Meacham, Jeffrey W., 3,945,945.

Mead Johnson & Company: *See—*
Wu, Yao Hua; and Lobeck, Walter G., Jr., 3,946,004.

Meadox Medicals, Inc.: *See—*
Liebig, William J., 3,945,052.

Meads, Philip F., Jr.: *See—*
Brobeck, William M.; Givins, John S., Jr.; Meads, Philip F., Jr.; and Thomas, Robert E., 3,946,220.

Meagher, William Kevin. Blasting mat. 3,945,319, Cl. 102-22.000.

Mechlinski, Witold: *See—*
Schaffner, Carl P.; and Mechlinski, Witold, 3,945,993.

Meckstroth, Alan F. Necktie hanger. 3,945,500, Cl. 211-113.000.

Meckstroth, Alan F.: *See—*
Servais, Ronald A.; Bauer, Paul T.; and Meckstroth, Alan F., 3,945,677.

Medicharge Limited: *See—*
Mote, Harold Trevor; Hajdu, Laszlo; and Ronay, Bela, 3,945,851.

Medicor Muvek: *See—*
Mote, Harold Trevor; Hajdu, Laszlo; and Ronay, Bela, 3,945,851.

Medovar, Boris Izrailevich: *See—*
Paton, Boris Evgenievich; Latash, Jury Vadimovich; Medovar, Boris Izrailevich; Emelianenko, July Georgievich; and Kljuev, Mikhail Markovich, 3,945,818.

Mee, Jack E.; Heinz, David M.; Hamilton, Thomas N.; Besser, Paul J.; and Pulliam, George R., to Rockwell International Corporation. Method of forming a composite structure. 3,946,124, Cl. 427-8.000.

Mehnert, Walter Erich: *See—*
Erben, Klaus Dieter; Kroy, Walter; and Mehnert, Walter Erich, 3,946,233.

Meijerink, Harrie H. J.: *See—*
Paasen, Mathijs M. F.; and Meijerink, Harrie H. J., 3,946,076.

Melendo, Sabino de Bernedo: *See—*
Llona, Jesus Gomez; and Melendo, Sabino de Bernedo, 3,946,281.

Melito, Maurice A., Jr.: *See—*
Daniels, John F.; Melito, Maurice A., Jr.; and Szymansky, Edward, 3,945,115.

Melrath, Richard L. Bird feeder. 3,945,344, Cl. 119-51.00R.

Melugin, Leland A.; and Parchesky, Joseph, to Datatype Corporation. Document feed for optical scanner. 3,946,205, Cl. 235-61.11E.

Mentz, Ben J.: *See—*
Hempell, Stephen W.; and Mentz, Ben J., 3,945,908.

Menzies, John Ian, to Heatshield Research and Development Pty., Ltd. Method of applying heat insulating material to sheet metal. 3,945,868, Cl. 156-164.000.

Merck & Co., Inc.: *See—*
Lee, Leonard S.; Siegel, Howard M.; and Sopp, Samuel W., 3,945,862.

Merck Sharp & Dohme (I.A.) Corporation: *See—*
Wasson, Burton Kendall; and Weinstock, Leonard M., 3,946,009.

Merry, Deane W.: *See—*
Harendza-Harinxma, Alfred J., 3,946,101.

Messer Griesheim GmbH: *See—*
Boehme, Dietrich; Hahn, Gunter; Schumann, Gunter; Wienen, Walter; and Jung, Rolf, 3,945,279.

Messer, Mayer Naoum: *See—*
Farge, Daniel; Goff, Yves le; Messer, Mayer Naoum; and Poiget, Gilbert, 3,946,019.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Erben, Klaus Dieter; Kroy, Walter; and Mehnert, Walter Erich, 3,946,233.

Messineo, Samuel V.: *See—*
United States of America, National Aeronautics and Space Administration; Haynie, Cyrus C.; and Messineo, Samuel V., 3,945,879.

Metallgesellschaft Aktiengesellschaft: *See—*
Scheiber, Werner, 3,946,125.

Metallurgical Processes Ltd.: *See—*
Harris, Colin Frank, 3,946,098.

Metcalf, Brian Walter; and Jung, Michel, to Richardson-Merrell Inc. Acetylene derivatives. 3,946,060, Cl. 260-448.20N.

Metropolitan Stevedore Company: *See—*
Ide, Allan R., 3,945,674.

Metz, Joseph R., to Norco, Inc. Telescoping strut construction. 3,945,744, Cl. 403-317.000.

Meyer, Harry C., III: *See—*
Roberts, Thomas G.; Shatas, Romas A.; Meyer, Harry C., III; and Stettler, John D., 3,946,236.
Roberts, Thomas G.; Shatas, Romas A.; Meyer, Harry C., III; and Stettler, John D., 3,946,240.

Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. 2-Amino-1,4-dihydropyridine derivatives. 3,946,026, Cl. 260-295.50R.

Meyer, Horst: *See—*
Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 3,946,027.
Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 3,946,028.

Michels, Albertus Peter Johannes: *See—*
van Beukering, Henricus Cornelis Johannes; and Michels, Albertus Peter Johannes, 3,945,430.

Michurov, Jury Ivanovich: *See—*
Gershanov, Felix Borisovich; Liakumovich, Alexandr Grigorievich; Michurov, Jury Ivanovich; Pantukh, Boris Izrailevich; Rutman, Grigory Iosifovich; Sobolev, Valerian Mikhailovich; Grinberg, Alexandr Afroimovich; Gurvich, Yakov Abramovich; Zakharova, Nina Vasilievna; and Nafikova, Almira Mudarisovna, 3,946,086.

Microtork, Inc.: *See—*
Pearse, Robert G., 3,945,391.

Mihaly, Gyorgy, residuary legatee: *See—*
Deak, Gyula; Doda, Margit; Gyorgy, Lajos; Hazai, Laszlo; and Pfeifer, Klara, deceased, 3,946,018.

Milan, Albert R.; and Markley, Raymond L. Medical tissue-obtaining system. 3,945,372, Cl. 128-2.00B.

Milette, Roger C., to B. C. Ames Company. Dial indicators with interchangeable movement. 3,945,339, Cl. 116-129.00F.

Milianowicz, Stanislaw A., to Westinghouse Electric Corporation. Puffer piston gas blast circuit interrupter with insulating nozzle member. 3,946,183, Cl. 200-148.00A.

Millben, Lawrence A., to Burroughs Corporation. No-bounce electronically controlled switch circuit. 3,946,254, Cl. 307-268.000.

Miller, Charles G.: *See—*
United States of America, National Aeronautics and Space Administration; Miller, Charles G.; and Bartera, Ralph E., 3,945,801.

Miller, Clinton Earl; and Naggar, Nabil Gabriel. Method and means of improving laydown and writing characteristics of fibrous points and points obtained thereby. 3,945,869, Cl. 156-180.000.

Miller, Edward A., to Honeywell Inc. Fluid tight seal and method of making same. 3,945,648, Cl. 277-102.000.

Miller, Klaus, to Westinghouse Electric Corporation. Outer cylinder for a low pressure turbine apparatus. 3,945,760, Cl. 415-189.000.

Miller, Ray Andrew. Door clamp. 3,945,087, Cl. 24-73.0CS.

Miller, Robert A. Advertising device. 3,945,139, Cl. 40-130.00R.

Milles, Hubert: *See—*
Dahlem, Peter; and Milles, Hubert, 3,945,315.

Millicovsky, William: *See—*
Bennett, Russell B.; Millicovsky, William; and Pritz, Howard B., 3,945,383.

Millman, Morris H.: *See—*
Friedman, Howard; Levinson, David W.; and Millman, Morris H., 3,945,826.

Milman, Boris Samoilovich; Mirzoian, Genrikh Sergeevich; Strizhov, Gennady Sergeevich; Tinyakov, Viktor Gurievich; Doroschenko, Pavel Petrovich; Karssky, Vladimir Evgenievich; Levin, Moisei Markovich; Krapukhin, Viktor Mikhailovich; and Semenov, Pavel Vladimirovich. Installation for producing bimetallic solid bodies of cylindrical shape. 3,945,427, Cl. 164-298.000.

Milwaukee Electric Tool Corporation: *See—*
Ritz, Alan J., 3,945,120.

Mima, Yasuhiro; and Yamada, Masaaki, to Green Cross Corporation, The. Preparation of human placental hyaluronidase. 3,945,889, Cl. 195-62.000.

Minakov, Anatoly Petrovich: *See—*
Yascheritsyn, Petr Ivanovich; Golant, Jury Khonanovich; Leushkin, Vadim Nikolaevich; Mironov, Gennady Mikhailovich; Minakov, Anatoly Petrovich; and Bogachev, Viktor Vladimirovich, 3,945,098.

Minato, Yoshizo; and Nishikawa, Shikibu, to Koei Chemical Co., Ltd. Process for producing pyridine bases. 3,946,020, Cl. 260-290.00P.

Mineda, Hisahal: *See—*
Murase, Genyo; Mineda, Hisahal; and Yamaguchi, Yozo, 3,945,662.

Minigrip, Inc.: *See—*
Noguchi, Takashi, 3,945,403.

Minner, Willy; and Muller, Jorn, to Licentia Patent- Verwaltungs-G.m.b.H. Transmitter amplifier. 3,946,326, Cl. 330-26.000.

Minnesota Mining and Manufacturing Company: *See—*
Filson, John Richard, 3,945,709.
Lunde, George G., 3,946,402.
Seim, William J.; and Kahabka, Richard D., 3,945,705.
Torp, Bruce A.; and Shaffer, Edward C., 3,945,935.
Tung, Chi Fang; and Laird, James A., 3,946,130.
Westberg, Walter M., 3,945,079.

Minns, George Eric, to Dewhurst & Partner Limited. Positional control. 3,945,470, Cl. 187-29.00R.

Mino, Junryo: *See—*
Arai, Haruhiko; Mino, Junryo; and Ide, Kimie, 3,945,951.

Minolta Camera Kabushiki Kaisha: *See—*
Nakamura, Yoshihiro, 3,946,199.

Miokovic, Stevan, to Regie Nationale des Usines Renault. Shaft coupling with variable timing. 3,945,221, Cl. 64-24.000.

Miranker, Samuel. Process for removing separating thread from a web of knitted garment portions or the like. 3,945,096, Cl. 28-76.00T.

Mironov, Gennady Mikhailovich: *See—*
Yascheritsyn, Petr Ivanovich; Golant, Jury Khonanovich; Leushkin, Vadim Nikolaevich; Mironov, Gennady Mikhailovich; Minakov, Anatoly Petrovich; and Bogachev, Viktor Vladimirovich, 3,945,098.

Mirzoian, Genrikh Sergeevich: *See—*
Milman, Boris Samoilovich; Mirzoian, Genrikh Sergeevich; Strizhov, Gennady Sergeevich; Tinyakov, Viktor Gurievich; Doroschenko, Pavel Petrovich; Karsaky, Vladimir Evgenievich; Levin, Moisei Markovich; Krapukhin, Viktor Mikhailovich; and Semenov, Pavel Vladimirovich, 3,945,427.

Mishler, Michael L.: *See—*
Buckman, Stanley J.; Lang, Rudolf F.; and Mishler, Michael L., 3,946,061.

Mitchell, Robert W.: *See—*
Larsen, Richard J.; and Mitchell, Robert W., 3,945,093.

Mitchell S.A.: *See—*
Frechin, Jean-Paul, 3,945,658.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Sumida, Shizuo; Nii, Kazuo; Ito, Hisatsugu; Ueda, Atsushi; and Ishii, Mitsuaki, 3,946,362.

Mitsui Mining & Smelting Co., Ltd.: *See—*
Sakai, Toshiyuki; Miyazaki, Kazuhide; and Yamamoto, Michiaki, 3,945,947.

Mitsui Shipbuilding & Engineering Co., Ltd.: *See—*
Hakozaki, Hiroshi, 3,946,363.

Miura, Masaki; Ichiryu, Ken; Shigeta, Masayuki; and Shibata, Tadashi, to Hitachi, Ltd. Sound preventive device for use in elevator. 3,945,468, Cl. 187-1.00R.

Miura, Shigetaka; and Oikawa, Masashi, to Kabushikikaisha Yokogawa Denki Seisakusho. Recorder. 3,946,406, Cl. 346-145.000.

Miura, Taro; and Yamamoto, Takahiro, to TDK Electronics Co., Ltd. Dielectric apparatus and method utilizing resonance for humidity measurement. 3,946,308, Cl. 324-58.50C.

Miya, Kenichi, to Kokusai Denwa Kabushiki Kaisha. Bilateral signal transmission system. 3,946,169, Cl. 179-170.00R.

Miyakado, Satoru: *See—*
Yatsunami, Kazuharu; Miyakado, Satoru; Shiohara, Katsuaki; and Honda, Akira, 3,945,817.

Miyano, Shizuo: *See—*
Yazawa, Kenichiro; Kishimoto, Shinzo; Miyano, Shizuo; and Kondo, Asaji, 3,945,830.

Miyata, Fumio, to Sakura Color Products Corporation. Ink composition. 3,945,836, Cl. 106-22.000.

Miyata, Fumio; and Okuda, Yasuji, to Sakura Color Products Corporation. Ink composition. 3,945,837, Cl. 106-22.000.

Miyata, Masao: *See—*
Imazu, Katsuhiro; and Miyata, Masao, 3,945,231.

Miyazaki, Kazuhide: *See—*
Sakai, Toshiyuki; Miyazaki, Kazuhide; and Yamamoto, Michiaki, 3,945,947.

Mizukami, Etsuo: *See—*
Inazaki, Kenzoo; Kanatani, Yoshiharu; Ise, Masahiro; Mizukami, Etsuo; and Suzuki, Chuji, 3,946,371.

Mizutani, Yukio; Izumi, Yusuke; and Watanabe, Yoshiaki, to Tokuyama Soda Kabushiki Kaisha. Method of condensing ketones. 3,946,079, Cl. 260-593.00R.

Mlinko, Sandor; Banfi, Dezso; Gacs, Istvan; Payer, Karoly; Otvos, Laszlo; Vargay, Zoltan; Dobis nee Farkas, Emilia; and Palagyi, Tivadar, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT. Process and apparatus for measuring the isotope content of substances labelled with ^{3}H or ^{2}H and ^{14}C isotopes. 3,945,797, Cl. 23-230.0PC.

Mo, Olav. Arrangement in or relating to caissons or the like. 3,945,212, Cl. 61-46.500.

Mobil Oil Corporation: *See—*
Brennan, James A.; and Morrison, Roger A., 3,945,913.
Chibnik, Sheldon; and Otto, Ferdinand P., 3,945,933.

Mochizuki, Yoshifumi: *See—*
Kimura, Satoshi; Mochizuki, Yoshifumi; and Yasuda, Tetsuya, 3,945,190.

Modine Manufacturing Company: *See—*
Costello, Norman F.; and Cook, Neal A., 3,945,805.
Costello, Norman F.; and Cook, Neal A., 3,945,806.

Moergeli, Walter Rudolf: *See—*
James, George Stephen; Dewar, Bruce Ian; and Moergeli, Walter Rudolf, 3,945,892.

Mohan, Suchendra: *See—*
Khann, Pushpa; Nag, Tej Narain; Chandrajain, Satish; and Mohan, Suchendra, 3,945,988.

Mohon, Windell N.; Derderian, George; and Breglia, Denis R., to United States of America, Navy. Weapons training simulator utilizing polarized light. 3,945,133, Cl. 35-25.000.

Mohr, Reinhard: *See—*
Fleckenstein, Erwin; Heinrich, Ernst; and Mohr, Reinhard, 3,946,024.

Mojonnier Bros. Co.: *See—*
Skoli, Sigmund P.; Witt, Chester J.; and Jones, Hartl R., 3,945,411.

Monacelli, Umberto. Staple-feeding magazine for a stapler. 3,945,550, Cl. 227-126.000.

Monarch Marking Systems, Inc.: *See—*
Jones, Frederick L., 3,946,138.

Monroe Auto Equipment Company: *See—*
Palmer, Dale A., 3,945,474.

Monsanto Company: *See—*
Hamner, William F., 3,945,080.
Hoagland, John C.; Rutkowski, Robert; and Yonko, Jon D., 3,945,682.
Phillips, Wendell Gary, 3,946,071.
Tyssee, Donald A., 3,945,896.

Moodie, Rodger H.; and Fennel, Patrick W. Tilting device. 3,945,611, Cl. 254-131.000.

Moolenbeek, Rob; and Norlund, Bent, to GTE Laboratories Incorporated. Control circuit for a rotating magnetic field of a bubble memory. 3,946,373, Cl. 340-174.0TF.

Moore, Geoffrey James: *See—*
Case, John Reginald; and Moore, Geoffrey James, 3,946,023.

Moore, John C., to Lowrance Electronics, Inc. Sonar flasher speed control. 3,946,295, Cl. 318-317.000.

Moran, Vernon J., to Bomor Equipment, Inc. Cooking apparatus for loose food products. 3,945,309, Cl. 99-348.000.

Morgan, Charles R., to W. R. Grace & Co. Curable polyene-polythiol compositions. 3,945,982, Cl. 260-77.5BB.

Morganstein, Melvyn I., to United States of America, Army. Displacement-variable damping for dash-pot type electrolyte ampule. 3,945,845, Cl. 136-90.000.

Mori, Toshiro; and Ando, Seigo, to Nippon Kokan Kabushiki Kaisha. Apparatus for detecting the physical properties of magnetic or electric conductive heat-responsive or deformable material using negative input impedance network. 3,946,307, Cl. 324-34.00R.

Morimoto, Yoshio: *See—*
Tsujikawa, Atsushi; and Morimoto, Yoshio, 3,946,217.

Morita, Minoru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Structure for preventing oil leakage in a rotary engine. 3,945,776, Cl. 418-142.000.

Moriyama, Inao; Tanaka, Keiji; Yujiro, Ando; and Ohara, Katsunobu, to Canon Kabushiki Kaisha. Flat screen electrostatic copier. 3,945,725, Cl. 355-3.00R.

Morris, James B., Sr.: *See—*
Wood, John R.; Morris, James B., Sr.; and Massoletti, Arnold M., 3,945,196.

Morrison, Roger A.: *See—*
Brennan, James A.; and Morrison, Roger A., 3,945,913.

Morton-Norwich Products, Inc.: *See—*
Pelosi, Stanford S., Jr., 3,946,049.
Schwan, Thomas J., 3,946,075.
Wright, George C., 3,946,042.

Mosby, Geoffrey Ralph, to Lucas Electrical Company Limited. Dual function electrical switch. 3,945,492, Cl. 200-246.000.

Moseman, Paul W., Jr.; Passeri, David; and Carrico, John P., to Bendix Corporation, The. Gain control for a quadrupole mass spectrometer. 3,946,229, Cl. 250-292.000.

Moslener, Jorn, to Demag Aktiengesellschaft. Apparatus for on-line coiling of wire-like materials, and related method. 3,945,585, Cl. 242-81.000.

Mote, Harold Trevor; Hajdu, Laszlo; and Ronay, Bela, to Medicharge Limited; and Medicor Muvek. Silver zinc electric storage cells. 3,945,851, Cl. 136-111.000.

Motoda, Kenro. Lifting apparatus. 3,945,612, Cl. 254-173.00R.

Motomura, Takayuki: *See—*
Suzuki, Masahiko; Motomura, Takayuki; Seko, Kiyoshi; and Takahashi, Hiroshi, 3,945,614.

Motoren-und Turbinen-Union Friedrichshafen GmbH: *See—*
Leicht, Werner, 3,945,762.

Motoren-und Turbinen Union Munich GmbH: *See—*
Rossmann, Axel; and Hagemeister, Klaus, 3,945,101.

Motorola, Inc: *See—*
Krolik, Kenneth J., 3,946,313.

Motorola, Inc.: *See—*
Alexander, Norman P.; and Gasparaitis, Bernard, 3,946,390.
Augustine, Lawrence G., 3,946,423.
Cuckler, Virgil A.; and Yost, Russell R., Jr., 3,946,391.
Frisbie, Milo W.; and McKinley, Milton R., 3,945,505.
Greeson, Richard L.; and Philofsky, Elliott M., 3,945,111.
Irwin, James S., 3,946,397.
Krolik, Kenneth J., 3,946,321.
Marley, Robert R., 3,946,246.
Mason, Daniel W., 3,945,195.

Mouat, Thomas W.; and LeMasurier, Philip Howard, to Weldwood of Canada Limited. Apparatus and method for centering logs for veneer processing. 3,945,125, Cl. 33-174.00R.

Mowrey, Melvin, Jr., to Maryland Cup Corporation. Apertured lid and method for manufacturing same. 3,945,528, Cl. 220-265.000.

MPR Associates, Inc.: *See—*
Weems, Sterling J., 3,945,509.

Mueller, Theodore H.: *See—*
Ryder, Francis E.; and Mueller, Theodore H., 3,945,717.

Mullaney, Paul F.: *See—*
Salzman, Gary C.; and Mullaney, Paul F., 3,946,239.

Muller, Anton, to Eisen- und Drahtwerk Erlau Aktiengesellschaft. Linkage arrangement for antiskid vehicle tire chains. 3,945,418, Cl. 152-243.000.

Muller, Jorn: *See—*
Minner, Willy; and Muller, Jorn, 3,946,326.

Muller, Pierre. Method of spinning synthetic textile fibers. 3,945,188, Cl. 57-156.000.

Murano, Minoru; Yanabu, Satoru; Tamagawa, Toru; Takahashi, Nobuyuki; Okumura, Hiroyuki; and Ohhashi, Hiroshi, to Tokyo Shibaura Electric Co., Ltd. Vacuum interrupter. 3,946,179, Cl. 200-144.00B.

Murase, Genyo; Mineda, Hisahal; and Yamaguchi, Yozo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Energy absorbing steering assembly. 3,945,662, Cl. 280-87.00R.

Murata Kikai Kabushiki Kaisha: *See—*
Matsui, Isamu; Sakai, Shoji; Tsukada, Susumu; and Kawarabayashi, Susumu, 3,945,488.

Murayama, Eichi: *See—*
Matsui, Masanao; Katsube, Junki; Shimomura, Hiromi; and Murayama, Eichi, 3,946,065.

Murib, Jawad H.: *See—*
Kwiatek, Jack; Murib, Jawad H.; and Brush, Charles K., 3,946,067.

Murphy, Peter J. Laminar flow pipe system. 3,945,402, Cl. 138-37.000.

Musall, Reimar; Wolsing, Wilhelm; and Almeroth, Klaus, to Kali-Chemie AG. Elastic support for a ceramic monolithic catalyzer body. 3,945,803, Cl. 23-288.0FC.

Myreen, Bertel: *See—*
Tuomaala, Jorma Aarne Kullervo; and Myreen, Bertel, 3,945,615.

N. A. Woodworth Company: *See—*
Hohwart, George; Toth, Paul; and Cross, Kenneth O., 3,945,652.

N L Industries, Inc.: *See—*
Easwaran, Jairaj; and Foerster, George S., 3,945,819.
Manigault, Edward L., 3,945,839.
Schwarcz, Joseph; Engelbart, Bernard; and White, Edward L., 3,945,974.

Nachbur, Hermann; and Maeder, Arthur, to Ciba-Geigy Corporation. Bromine substituted phosphates. 3,946,092, Cl. 260-964.000.

Naf, Ferdinand: *See—*
Rautenstrauch, Valentin; and Naf, Ferdinand, 3,946,078.

Nafikova, Almira Mudarisovna: *See—*
Gershanov, Felix Borisovich; Liakumovich, Alexandr Grigorievich; Michurov, Jury Ivanovich; Pantukh, Boris Izrailevich; Rutman, Grigory Iosifovich; Sobolev, Valerian Mikhailovich; Grinberg, Alexandr Afroimovich; Gurvich, Yakov Abramovich; Zakharova, Nina Vasilievna; and Nafikova, Almira Mudarisovna, 3,946,086.

Nag, Tej Narain: *See—*
Khann, Pushpa; Nag, Tej Narain; Chandrajain, Satish; and Mohan, Suchendra, 3,945,988.

Nagai, Hidetaka; Sato, Eiichi; and Kobayashi, Fujio, to Kowa Company, Ltd. Preparation of anti-α1-fetoglobulin. 3,946,105, Cl. 424-12.000.

Nagai, Hiroshi: *See—*
Furukawa, Kaoru; Tsukamoto, Chiaki; Nagai, Hiroshi; Matsunami, Koichi; and Nagano, Hikoichi, 3,946,089.

Nagai, Kiichi: *See—*
Fujimoto, Yasuo; Tatsukawa, Keizo; Nagaoka, Koichi; Nagumo, Masayuki; and Nagai, Kiichi, 3,945,952.

Nagamatsu, Kazuo; Kinoshita, Yoshitsugu; Kawajiri, Seizo; and Uda, Yoshiaki, to Takeda Chemical Industries, Ltd. Apparatus for continuous, automatic sterilization of fluid in sealed containers. 3,945,796, Cl. 21-80.000.

Nagami, Masaru; and Niino, Osami, to Sony Corporation. Signal control circuit. 3,946,249, Cl. 307-233.00A.

Nagano, Hikoichi: *See—*
Furukawa, Kaoru; Tsukamoto, Chiaki; Nagai, Hiroshi; Matsunami, Koichi; and Nagano, Hikoichi, 3,946,089.

Nagao, Masami: *See—*
Ueda, Harutoshi; Suzuki, Naoyuki; and Nagao, Masami, 3,945,840.

Nagaoka, Koichi: *See—*
Fujimoto, Yasuo; Tatsukawa, Keizo; Nagaoka, Koichi; Nagumo, Masayuki; and Nagai, Kiichi, 3,945,952.

Nagara, Tosio: *See—*
Kinoshita, Isao; Nagara, Tosio; and Kaziwara, Tosiro, 3,945,454.

Nagasako, Isamu: *See—*
Anazawa, Shinzo; Ueno, Seiichi; Nagasako, Isamu; Nawa, Tadashi; Irie, Toshiaki; and Sando, Shigeru, 3,946,428.

Nagashima, Akira; and Inaga, Hisashi, to Kioritz Corporation. Vibration isolation device for handles of chain saw. 3,945,119, Cl. 30-383.000.

Nagayama, Masuzo: *See—*
Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Nagayama, Masuzo, 3,946,055.

Naggar, Nabil Gabriel: *See—*
Miller, Clinton Earl; and Naggar, Nabil Gabriel, 3,945,869.

Nagler, William M.; and Woosley, Vernon Earl, to Pate Company, The. ABS thermoplastic curb assembly. 3,945,163, Cl. 52-219.000.

Nagumo, Masayuki: *See—*
Fujimoto, Yasuo; Tatsukawa, Keizo; Nagaoka, Koichi; Nagumo, Masayuki; and Nagai, Kiichi, 3,945,952.

Naito, Takayuki; Okumura, Jun; and Kamachi, Hajime, to Bristol-Myers Company. 7-[α-(2-Aminomethyl-1-cyclohexenyl)-acetamido]-3-heterocyclic thiomethyl-3-cephem-4-carboxylic acids. 3,946,000, Cl. 260-243.00C.

Nakagawa, Tadashi: *See—*
Onda, Eiichi; Koyama, Mitsuo; and Nakagawa, Tadashi, 3,946,413.

Nakagome, Takenari: *See—*
Yamada, Hirotada; Tobiki, Hisao; Nakatsuka, Iwao; Tanno, Norithiko; Shimago, Kozo; and Nakagome, Takenari, 3,945,995.

Nakajima, Yasutaka; Sasaki, Toshiharu; and Katakabe, Noboru, to Matsushita Electric Industrial Co., Ltd. - Wireless Research Laboratory. Photographic printing and processing apparatus. 3,945,727, Cl. 355-27.000.

Nakamura, Giichi. Completely fluidtight and frictionless shaft seal packing. 3,945,649, Cl. 277-123.000.

Nakamura, Minoru; and Kosaka, Shin, to Osaka Kiko Co., Ltd. Pneumatic and static electricity open-end spinning method and apparatus therefor. 3,945,185, Cl. 57-58.950.

Nakamura, Yoshihiro, to Minolta Camera Kabushiki Kaisha. Temperature control means for toner fusing device in an electrostatic copier. 3,946,199, Cl. 219-499.000.

Nakano, Shoitsu: *See—*
Ishimaru, Satoshi; and Nakano, Shoitsu, 3,946,317.

Nakao, Hisaji; Fukuma, Nobuo; Matsubara, Hideyuki; Takasu, Tadahiro; and Yoneda, Takao, to Toyota Jidosha Kokyo Kabushiki Kaisha; and Toyota Jidosha Kokyo Rabushiki Kaisha. Automatic quality control system. 3,946,212, Cl. 235-151.130.

Nakashiki, Koso; Yoshimoto, Akira; and Osaki, Kazuhiko, to Sailor Pen Co., Ltd., The. Socket for holding the writing ball of a ball point pen. 3,945,735, Cl. 401-216.000.

Nakasyo, Koichi: *See—*
Tomioka, Shozo; Matsushima, Shujiro; Koezuka, Yokichi; Tanabe, Geniti; and Nakasyo, Koichi, 3,945,230.

Nakatsuka, Iwao: *See—*
Yamada, Hirotada; Tobiki, Hisao; Nakatsuka, Iwao; Tanno, Norithiko; Shimago, Kozo; and Nakagome, Takenari, 3,945,995.

Nakaya, Tadao, to Kabushiki Kaisha Mitutoyo Seisakusho. Dial gauge measuring the length in two different units. 3,945,258, Cl. 74-29.000.

Nakayama, Takao: *See—*
Yamazaki, Chikayasu; Nakayama, Takao; and Kawabe, Noriyuki, 3,945,181.

Nalco Chemical Company: *See—*
Holty, David W.; and Lauterbach, George E., 3,945,843.

Narita, Yoshihiro: *See—*
Kobayashi, Haruo; Asajima, Takenori; and Narita, Yoshihiro, 3,945,979.

National Distillers and Chemical Corporation: *See—*
Kwiatek, Jack; Murib, Jawad H.; and Brush, Charles K., 3,946,067.

National Research Development Corporation: *See—*
Paton, William, 3,945,783.

National Science Foundation: *See—*
Johnson, Roger L.; and Weber, Larry F., 3,946,381.

National Steel Corporation: *See—*
Jakimowicz, Christopher; and Duford, Thomas G., 3,945,308.

Nawa, Tadashi: *See—*
Anazawa, Shinzo; Ueno, Seiichi; Nagasako, Isamu; Nawa, Tadashi; Irie, Toshiaki; and Sando, Shigeru, 3,946,428.

Nebolsine, Rostislav. Method and apparatus for cleansing well liner and adjacent formations. 3,945,436, Cl. 166-303.000.

Nelson, Bertel S.; and Nelson, Woodrow D., to Wedgtrac Corporation. Friction drive transmission. 3,945,270, Cl. 74-798.000.

Nelson, Hjalmar N., to Texas Instruments Incorporated. Thermally responsive switch. 3,946,352, Cl. 337-361.000.

Nelson, Jerry J.: *See—*
Drake, Dale E.; and Nelson, Jerry J., 3,945,331.

Nelson, Woodrow D.: *See—*
Nelson, Bertel S.; and Nelson, Woodrow D., 3,945,270.

Nessar, Joseph D., to Diamond Shamrock Corporation. Method for electrocoating conductive articles. 3,945,901, Cl. 204-181.000.

Neu, Frank D.: *See—*
Wohlmut, Peter G.; and Neu, Frank D., 3,946,367.

Neuman, John G.; and Johnston, Richard W., to General Motors Corporation. Internal combustion engine ignition system. 3,945,362, Cl. 123-148.00E.

Neuman, Lewis A. Harness for safety shield type children's car seat. 3,945,678, Cl. 297-390.000.

New York City Transit Authority: *See—*
Bush, Charles J., 3,945,566.

Nicholson, Charles B., Jr., to Albany Engineered Systems. Filter device. 3,945,925, Cl. 210-435.000.

Nickols, Richard C., Jr., to United Aircraft Corporation. Electrochemical cell. 3,945,844, Cl. 136-86.00R.

Nicolai, Van O.: *See—*
Pollack, Slava A.; and Nicolai, Van O., 3,946,331.

Nicosia, Joseph T. Solder iron tips. 3,945,553, Cl. 228-20.000.

Niestroj, Heinz: *See—*
Landwehrkamp, Hans; and Niestroj, Heinz, 3,945,183.

Nihon Shinku Gijutsu Kabushiki Kaisha: *See—*
Fukutome, Riichi, 3,945,807.

Nii, Kazuo: *See—*
Sumida, Shizuo; Nii, Kazuo; Ito, Hisatsugu; Ueda, Atsushi; and Ishii, Mitsuaki, 3,946,362.

Niino, Osami: *See—*
Nagami, Masaru; and Niino, Osami, 3,946,249.

Nikaido, Norio; Shirai, Shinji; Iihashi, Mototaka; and Umemoto, Sueo, to Kansai Paint Company, Limited; and Fuji Sashi Industries Limited. Process for coating aluminum or aluminum alloy. 3,945,899, Cl. 204-181.000.

Nippon Denso Co., Ltd.: *See—*
Kinoshita, Isao; Nagara, Tosio; and Kaziwara, Tosiro, 3,945,454.

Nippon Electric Company, Limited: *See—*
Anazawa, Shinzo; Ueno, Seiichi; Nagasako, Isamu; Nawa, Tadashi; Irie, Toshiaki; and Sando, Shigeru, 3,946,428.
Ueki, Atsufumi; Nishida, Nobuo; and Takahashi, Shinji, 3,946,430.
Yonezu, Hiroo; and Yuasa, Tonao, 3,946,334.

Nippon Kogaku K.K.: *See—*
Iida, Yozo, 3,945,719.

Maida, Osamu, 3,946,410.
Toyoda, Kenji, 3,946,409.
Nippon Kokan Kabushiki Kaisha: *See—*
Matsubara, Hiroyoshi; Osuka, Tatsumi; and Sugiyama, Tadao, 3,945,858.
Mori, Toshiro; and Ando, Seigo, 3,946,307.
Tsuyama, Yoshizo, 3,945,675.
Yatsunami, Kazuharu; Miyakado, Satoru; Shiohara, Katsuaki; and Honda, Akira, 3,945,817.
Nippon Light Metal Research Laboratory, Ltd.: *See—*
Sugiyama, Noboru; Suzuki, Masamichi; Watanabe, Katami; Sugiyama, Keiichi; Tadenuma, Hachiro; Kato, Takashi; Kaneda, Ryoji; and Yoshino, Makoto, 3,945,930.
Yanagisawa, Ikuo; and Kawai, Toshiyuki, 3,945,428.
Nippon Shokubai Kazaku Kogyo Co. Ltd.: *See—*
Tsubakimoto, Tsuneo; and Fuzikawa, Iwao, 3,945,980.
Nippon Soken, Inc.: *See—*
Oishi, Kazuo; Yamada, Takashi; and Matsui, Takeshi, 3,945,459.
Nippon Zoki Pharmaceutical Co., Ltd.: *See—*
Takino, Masuichi; Kurosaki, Teikichi; and Odaka, Munehiko, 3,946,012.
Nishida, Nobuo: *See—*
Ueki, Atsufumi; Nishida, Nobuo; and Takahashi, Shinji, 3,946,430.
Nishikawa, Shikibu: *See—*
Minato, Yoshizo; and Nishikawa, Shikibu, 3,946,020.
Nishimura, Takeshi: *See—*
Nishizawa, Jun-ichi; Sasaki, Ichiemon; Ishida, Katsuhiko; Tauchi, Syoji; Nishimura, Takeshi; Seki, Takeo; and Kozuma, Noboru, 3,946,270.
Nishizawa, Jun-ichi; Sasaki, Ichiemon; Ishida, Katsuhiko; Tauchi, Syoji; Nishimura, Takeshi; Seki, Takeo; and Kozuma, Noboru, to Semiconductor Research Foundation; and Hitachi, Ltd. Signal collecting and distributing systems. 3,946,270, Cl. 315-169.0TV.
Nissan Chemical Industries, Ltd.: *See—*
Koto, Noriaki; Kondo, Keiichi; and Okada, Naotake, 3,946,093.
Nissan Motor Company Limited: *See—*
Hamada, Mitsuharu; and Uchiyama, Hiromichi, 3,945,455.
Hiruma, Mituo, 3,945,664.
Ishikawa, Yoshikazu, 3,945,345.
Shimizu, Kazuaki, 3,945,471.
Suzuki, Kunihiko; and Kurisu, Katsuyasu, 3,945,458.
Nitto Kasei Co. Ltd.: *See—*
Sakamoto, Kazuhiko, 3,945,972.
Niwa, Toshinori: *See—*
Tsuji, Rokuro; and Niwa, Toshinori, 3,945,898.
NL Industries Inc.: *See—*
Simons, Leon, 3,945,272.
Nobusawa, Tsukumo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Light-measuring systems. 3,945,732, Cl. 356-222.000.
Noe, Robert Joseph; and Rutten, Pierre Jean, to Agfa-Gevaert N.V. Electrographic recording material. 3,946,140, Cl. 428-522.000.
Nogi, Syunsuke: *See—*
Ikeda, Takuo; Hadano, Takushige; and Nogi, Syunsuke, 3,945,990.
Noguchi, Takashi, to Minigrip, Inc. Tube construction for fastener profile strips. 3,945,403, Cl. 138-118.000.
Noguchi, Takashi. Making plastic film with profiles and opening means for bags. 3,945,872, Cl. 156-244.000.
Nonaka, Masahide: *See—*
Weaver, Merle L.; Hautala, Earl; and Nonaka, Masahide, 3,946,116.
Norco, Inc.: *See—*
Metz, Joseph R., 3,945,744.
Norddeutsche Seekabelwerke AG: *See—*
Boeke, Uwe; Hennemann, Lothar Roland; Hohorst, Wolfgang; and Urban, Horst, 3,945,701.
Nordsiek, Karl-Heinz: *See—*
Berg, Gerhard; Nordsiek, Karl-Heinz; and Barnstedt, Egge, 3,945,978.
Norlund, Bent: *See—*
Moolenbeek, Rob; and Norlund, Bent, 3,946,373.
North American Philips Corporation: *See—*
Crowell, Merton Howard, 3,946,264.
Northern Electric Company, Limited: *See—*
Boctor, Stalin A., 3,946,328.
Kuhfus, Gerd, 3,946,171.
Norton Company: *See—*
Kiovsky, Joseph R.; and Meacham, Jeffrey W., 3,945,945.
Norton, Ellis Charles, to U.M.E.C. - Boydell (Belting) Limited. Band conveyors. 3,945,487, Cl. 198-195.000.
Noshiro, Atsumi; and Inoue, Yoshio, to Dai Nippon Printing Co., Ltd. Dry planographic printing ink composition. 3,945,957, Cl. 260-3.300.
Notte, Louis R.: *See—*
Meacham, James F.; and Notte, Louis R., 3,946,283.
Nouni, Hiroaki: *See—*
Yamamatsu, Kenichi; Yamada, Shozo; Nouni, Hiroaki; and Yokoyama, Shuzi, 3,945,404.
Novo Products, Inc.: *See—*
Smallegan, Jon, 3,945,564.
Nutrilite Products, Inc.: *See—*
Westall, Edward B., 3,946,107.
O & K Orenstein & Koppel Aktiengesellschaft: *See—*
Ruttershoff, Heinz Joachim, 3,945,137.
Ochiai, Kiyozo: *See—*
Hagiya, Keiichi; Maki, Mamoru; Ogawa, Hiroshi; Hachiya, Takeo; and Ochiai, Kiyozo, 3,945,754.
Ochs, Gordon M.; and Wheeler, Raymond L., to Tidland Corporation. Rewind shaft. 3,945,583, Cl. 242-56.900.
O'Connor, John W., to Allis-Chalmers Corporation. Filtration for integrated tractor hydraulic system. 3,945,208, Cl. 60-420.000.
Odaka, Munehiko: *See—*
Takino, Masuichi; Kurosaki, Teikichi; and Odaka, Munehiko, 3,946,012.
Offermanns, Heribert: *See—*
Asinger, Friedrich; Pfeifer, Wolf Dieter; Offermanns, Heribert; Scherberich, Paul; and Schreyer, Gerd, 3,946,069.
Ofstead, Eilert A., to Goodyear Tire & Rubber Company, The. Metathesis of cycloolefins. 3,945,986, Cl. 260-93.100.
Ogawa, Hiroshi: *See—*
Hagiya, Keiichi; Maki, Mamoru; Ogawa, Hiroshi; Hachiya, Takeo; and Ochiai, Kiyozo, 3,945,754.
Ogle, Robert Walter, to IMS Limited. Device for introduction of liquid medication into a flexible bag. 3,945,382, Cl. 128-272.000.
Ohara, Katsunobu: *See—*
Moriyama, Inao; Tanaka, Keiji; Yujiro, Ando; and Ohara, Katsunobu, 3,945,725.
Ohhashi, Hiroshi: *See—*
Murano, Minoru; Yanabu, Satoru; Tamagawa, Toru; Takahashi, Nobuyuki; Okumura, Hiroyuki; and Ohhashi, Hiroshi, 3,946,179.
Ohi, Reiichi: *See—*
Shiba, Keisuke; Hinata, Masanao; Ohi, Reiichi; and Shishido, Tadao, 3,945,832.
Ohkubo, Kinji: *See—*
Asano, Yoshio; and Ohkubo, Kinji, 3,946,411.
Ohnishi, Kazuaki; and Ohnuki, Katsuhiro, to Matsushita Electric Works, Ltd. Remote supervision and control system. 3,946,380, Cl. 340-409.000.
Ohnuki, Katsuhiro: *See—*
Ohnishi, Kazuaki; and Ohnuki, Katsuhiro, 3,946,380.
Oikawa, Masashi: *See—*
Miura, Shigetaka; and Oikawa, Masashi, 3,946,406.
Oishi, Isamu: *See—*
Tobita, Susumu; Shimoishizaka, Masashi; Sumita, Yuzo; Oishi, Isamu; and Kato, Koji, 3,945,552.
Oishi, Kazuo; Yamada, Takashi; and Matsui, Takeshi, to Nippon Soken, Inc. Collision sensing system for vehicles. 3,945,459, Cl. 180-91.000.
Okada, Naotake: *See—*
Koto, Noriaki; Kondo, Keiichi; and Okada, Naotake, 3,946,093.
Okamoto, Takashi: *See—*
Sakata, Hiroshi; Okamoto, Takashi; and Hasegawa, Hirozo, 3,946,091.
Okano, Hiroshi: *See—*
Fukuhara, Satoru; Yamamoto, Shigehiko; and Okano, Hiroshi, 3,945,698.
Okano, Ryozo; and Tominaga, Nobuyoshi, to Yamaha Hatsudoki Kabushiki Kaisha. Lubrication system for motorcycles. 3,945,463, Cl. 184-6.130.
Okuda, Yasuji: *See—*
Miyata, Fumio; and Okuda, Yasuji, 3,945,837.
Okumura, Hiroyuki: *See—*
Murano, Minoru; Yanabu, Satoru; Tamagawa, Toru; Takahashi, Nobuyuki; Okumura, Hiroyuki; and Ohhashi, Hiroshi, 3,946,179.
Okumura, Jun: *See—*
Naito, Takayuki; Okumura, Jun; and Kamachi, Hajime, 3,946,000.
Okura Yusoki Kabushiki Kaisha: *See—*
Suizu, Dairi; and Kato, Yasuaki, 3,945,522.
Olinkraft, Inc.: *See—*
Harrelson, Glen R.; and Sherman, Earle C., 3,945,560.
Olmr, Jaroslav Jiri, to Textron Inc. Saw chain. 3,945,288, Cl. 83-834.000.
Olsen, Carl Ivar, to Danfoss A/S. Hydraulic steering apparatus. 3,945,457, Cl. 180-79.20R.
Olsen, James A.; and Butler, Lee D., to Sperry Rand Corporation. Tier pattern selection and formation for a bale wagon. 3,945,507, Cl. 214-6.00B.
Oltman, Henry G., Jr.; Pelner, Nathan; and Torgow, Eugene N., to Hughes Aircraft Company. Slot line/microstrip hybrid. 3,946,339, Cl. 333-11.000.
Omnitech Inc.: *See—*
DeAngelis, Armand, 3,945,043.
Omron Tateisi Electronics Co.: *See—*
Tsujikawa, Atsushi; and Morimoto, Yoshio, 3,946,217.
Onda, Eiichi; Koyama, Mitsuo; and Nakagawa, Tadashi, to Seiko Koki Kabushiki Kaisha. Shutter blade rebound preventive device for camera shutter. 3,946,413, Cl. 354-251.000.
Ono, Ichiro, to Alps Electric Co., Ltd. Tape recorder with counter drive mechanism responsive to tape movement. 3,946,437, Cl. 360-79.000.
Onarud Machine Works, Inc.: *See—*
Cummens, Joseph R., 3,945,757.
Orenstein & Koppel Aktiengesellschaft: *See—*
Heusler, Heimut; Alpers, Gunther; and Gerber, Jurgen, 3,945,138.
Ortiz, Nilson V. Rotatable disk chance device having edge indication. 3,945,644, Cl. 273-143.00D.
Orzel, Edward S., to Weatherhead Company, The. Blend back proportioning valve. 3,945,686, Cl. 303-6.00C.

Orzelek, Frank Joseph: *See—*
Zemek, Albert W.; Orzelek, Frank Joseph; and Ziemba, Mike L., 3,945,283.

Osaka Kiko Co., Ltd.: *See—*
Nakamura, Minoru; and Kosaka, Shin, 3,945,185.

Osaka Soda Co. Ltd.: *See—*
Sakamoto, Kazuhiko, 3,945,972.

Osaki, Kazuhiko: *See—*
Nakashiki, Koso; Yoshimoto, Akira; and Osaki, Kazuhiko, 3,945,735.

Osborn, Robert O., to Du Pont de Nemours, E. I., and Company. Process for bonding non-woven fibrous sheets and articles made therefrom. 3,945,873, Cl. 156-271.000.

Oster, Clark L.; and Tharp, James A., to Square D Company. Current limiting circuit breaker. 3,946,346, Cl. 335-16.000.

Osterkorn, Charles Louis; and Marino, Salvatore M., to Fedders Corporation. Ultrasonic soldering process. 3,945,554, Cl. 228-110.000.

Ostertag, Alfred; and Marx, Claus, to Christensen Diamond Products Co. Stabilizer for drill strings. 3,945,446, Cl. 175-323.000.

Ostrem, Obert M.; and Kulikowski, Donald F., to Continental Can Company, Inc. Method of and apparatus for forming folds in a container panel. 3,945,334, Cl. 113-121.00C.

Ostrow, Henry J. Wheeled attachment for a chair. 3,945,449, Cl. 180-6.500.

Osuga, Masanori; and Adachi, Hayao, to Fujisash Industries, Ltd. Method of producing colored anodic coating on aluminum and its alloys. 3,945,895, Cl. 204-58.000.

Osuka, Tatsumi: *See—*
Matsubara, Hiroyoshi; Osuka, Tatsumi; and Sugiyama, Tadao, 3,945,858.

Oswald, Robert A.; and Kilet, Charles R. Timing apparatus and system. 3,946,312, Cl. 324-181.000.

Otani, Susumu: *See—*
Katoh, Takashi; and Otani, Susumu, 3,945,085.

Otsuka, Shinjiro: *See—*
Ishimori, Shigeru; and Otsuka, Shinjiro, 3,945,893.

Otto Bock Orthopedic Industry, Inc.: *See—*
Kuehnegger, Walter, 3,945,376.

Otto, Ferdinand P.: *See—*
Chibnik, Sheldon; and Otto, Ferdinand P., 3,945,933.

Otto, Mark O., to Graco Inc. One shot metering gun. 3,945,533, Cl. 222-70.000.

Otvos, Laszlo: *See—*
Mlinko, Sandor; Banfi, Dezso; Gacs, Istvan; Payer, Karoly; Otvos, Laszlo; Vargay, Zoltan; Dobis nee Farkas, Emilia; and Palagyi, Tivadar, 3,945,797.

Oury, Robert F., to Rotec Industries. Single belt, multiple conveyor system. 3,945,484, Cl. 198-139.000.

Outboard Marine Corporation: *See—*
Aaen, Olav, 3,945,451.

Ouvrard, Paul, to Societe Anonyme dite: Antar Petroles de l'Atlantique. Method and device for the continuous automatic analysis of the filterability point of liquid substances, particularly diesel oil. 3,945,243, Cl. 73-17.00R.

Ovanin, George J., to S-P Manufacturing Corporation, The. Rotary jaw chuck with stock detector. 3,945,275, Cl. 82-40.00R.

Ovechkin, Alexandr Vasilievich: *See—*
Derevyankin, Nikolai Efimovich; Evseev, Vladimir Ivanovich; Zhuchkov, Ivan Ilich; Samoilov, Oleg Borisovich; and Ovechkin, Alexandr Vasilievich, 3,945,886.

Overbury, Francis G.; Barton, Paul; and Kelly, Kevin M., to International Standard Electric Corporation. Signal processor for doppler type navigation system. 3,946,320, Cl. 325-470.000.

Overbury, Francis G.; and Barton, Paul, to International Standard Electric Corporation. Navigation receiver with doppler filter gating. 3,946,386, Cl. 343-106.00D.

Owatonna Tool Company: *See—*
Solie, James C.; Doss, Daniel L.; and Waldrop, Jerald Lee, 3,945,610.

Owens-Corning Fiberglas Corporation: *See—*
Biefeld, Lawrence P.; Foley, Kevin M.; and McCombs, Frank Paul, 3,946,131.
Clark, Vincent de Paul, 3,945,962.
Erickson, Thomas D.; and Wolf, Warren W., 3,945,838.

Owens-Illinois, Inc.: *See—*
Spanoudis, Louis, 3,946,128.
Thomas, Ian M., 3,946,056.
Thomas, Ian M., 3,946,102.

Oxirane Corporation: *See—*
Borchert, Alfred E.; Capaldi, Eugene C.; and Ballard, Donnell A., 3,945,941.

Oxlade, Roy Ronald; and Westgarth, David James, to British Steel Corporation. Apparatus for applying a tensile load to a hollow shaft. 3,945,235, Cl. 72-238.000.

Oxy Metal Industries Corporation: *See—*
Clark, Chester G., 3,945,388.
Martin, Sylvia; Creutz, Hans Gerhard; and Becking, Donald Harvey, 3,945,894.

Oyama, George Clem. Method and apparatus for growing bean sprouts. 3,945,148, Cl. 47-14.000.

Oyamada, Yasutaka: *See—*
Yoshioka, Tsunehiko; Oyamada, Yasutaka; Iwaya, Shoichi; and Sato, Minoru, 3,946,290.

P. D. George Co., The: *See—*
Lange, Daniel J., 3,945,959.

P. R. Mallory & Co. Inc.: *See—*
Dey, Arabinda N., 3,945,846.
Dey, Arabinda N.; and Holmes, Robert W., 3,945,848.
Dey, Arabinda N., 3,945,852.

Paasen, Mathijs M. F.; and Meijerink, Harrie H. J., to Stamicarbon, N.V. Continuous process for recovery of cyclohexanone. 3,946,076, Cl. 260-586.00P.

Paddock, Paul F.; and Cramer, Jerry W., to Sunkist Growers, Inc. Article-orienting conveyor. 3,945,489, Cl. 198-266.000.

Page, Wilbur Mills; and Applewhite, Phillip, to Clayton Dewandre Company Limited. Full-power hydraulic braking systems. 3,945,685, Cl. 303-2.000.

Page, Wilbur Mills; and Applewhite, Phillip, to Clayton Dewandre Company Limited. Full-power hydraulic braking systems. 3,945,691, Cl. 303-84.00R.

Paice, Derek A.; and Shimp, Alan B., to United States of America, Interior. Active impedance multiplier. 3,946,279, Cl. 317-18.00C.

Pal, Dharam: *See—*
Paszyc, Aleksy J.; Pal, Dharam; and Curry, John B., 3,945,920.

Palagyi, Tivadar: *See—*
Mlinko, Sandor; Banfi, Dezso; Gacs, Istvan; Payer, Karoly; Otvos, Laszlo; Vargay, Zoltan; Dobis nee Farkas, Emilia; and Palagyi, Tivadar, 3,945,797.

Palitex Project Company GmbH: *See—*
Franzen, Gustav, 3,945,184.

Palmer, Dale A., to Monroe Auto Equipment Company. Shock absorber. 3,945,474, Cl. 188-322.000.

Paluch, Bernard R. Positive pressure breathing circuit. 3,945,378, Cl. 128-145.800.

Pannell, Robert T. Apparatus for emptying receptacles of particulate material. 3,945,512, Cl. 214-17.0DA.

Pantukh, Boris Izrailevich: *See—*
Gershanov, Felix Borisovich; Ljakumovich, Alexandr Grigorievich; Michurov, Jury Ivanovich; Pantukh, Boris Izrailevich; Rutman, Grigory Iosifovich; Sobolev, Valerian Mikhailovich; Grinberg, Alexandr Afroimovich; Gurvich, Yakov Abramovich; Zakharova, Nina Vasilievna; and Nafikova, Almira Mudarisovna, 3,946,086.

Papantoniou, Christos: *See—*
Jacquet, Bernard; Papantoniou, Christos; Dufaure, Pierre; and Mahieux, Claude, 3,946,035.

Parchesky, Joseph: *See—*
Melugin, Leland A.; and Parchesky, Joseph, 3,946,205.

Parel. Societe Anonyme: *See—*
James, George Stephen; Dewar, Bruce Ian; and Moergeli, Walter Rudolf, 3,945,892.

Parent, Richard A.; and Thomas, H. Ronald, to Xerox Corporation. Electrostatographic reversal development with developer comprising poly(p-xylene)-coated carrier particles. 3,945,823, Cl. 96-1.0SD.

Park, William Robb Roy: *See—*
Carmody, William D.; Park, William Robb Roy; and Gould, Gordon E., 3,945,495.

Parke, Davis & Company: *See—*
Goel, Om P., 3,946,015.

Parker Drilling Company: *See—*
Houck, Theodore B., 3,945,107.

Parker-Hannifin Corporation: *See—*
Marietta, Walter E., 3,945,764.
Reinicke, Robert H.; and Kenyon, Richard L., 3,945,395.

Parker, Kenneth O.; and Marksberry, Clarence L., to Garrett Corporation, The. Gas turbine heat exchanger apparatus. 3,945,434, Cl. 165-166.000.

Parker, Sidney A., to Lennox Industries, Inc. Environment control system. 3,945,218, Cl. 62-260.000.

Parmac, Inc.: *See—*
Prather, George A.; and Braschler, Steve A., 3,945,473.

Parmelee, David M. Display system. 3,945,132, Cl. 35-60.000.

Pashley, Richard D., to Intel Corporation. High speed MOS RAM employing depletion loads. 3,946,369, Cl. 340-173.00R.

Passeri, David: *See—*
Moseman, Paul W., Jr.; Passeri, David; and Carrico, John P., 3,946,229.

Paszyc, Aleksy J.; Pal, Dharam; and Curry, John B., to United States of America, Navy. Coanda effect oil-water separator. 3,945,920, Cl. 210-73.00W.

Pate Company, The: *See—*
Nagler, William M.; and Woosley, Vernon Earl, 3,945,163.

Patent Management, Inc.: *See—*
Paton, Boris Evgenievich; Latash, Jury Vadimovich; Medovar, Boris Izrailevich; Emelianenko, July Georgievich; and Kljuev, Mikhail Markovich, 3,945,818.

Paton, Boris Evgenievich; Latash, Jury Vadimovich; Medovar, Boris Izrailevich; Emelianenko, July Georgievich; and Kljuev, Mikhail Markovich, to Patent Management, Inc. Method for electroslag remelting with slag introduction and current circuit. 3,945,818, Cl. 75-10.00R.

Paton, William, to National Research Development Corporation. Fibre reinforced composites. 3,945,783, Cl. 425-122.000.

Patrick, Michael Dennis, Sr.: *See—*
Stepp, Gregory; and Patrick, Michael Dennis, Sr., 3,946,271.

Pauza, William Vito: *See—*
Sheesley, Wilmer Lee; and Pauza, William Vito, 3,945,808.

Pawlak, Kenneth E.: *See—*
Allison, Kenneth C.; Francis, Howard T.; Abele, Robert J.; and Pawlak, Kenneth E., 3,945,384.

Payer, Karoly: *See—*
Mlinko, Sandor; Banfi, Dezso; Gacs, Istvan; Payer, Karoly; Otvos, Laszlo; Vargay, Zoltan; Dobis nee Farkas, Emilia; and Palagyi, Tivadar, 3,945,797.

Payne, John Blunden: *See—*
Westwood, Walter; and Payne, John Blunden, 3,945,948.
Pearse, Robert G., to Microtork, Inc. Float controlled hydraulic leveler. 3,945,391, Cl. 137-45.000.
Peck, Albert William; and Richardson, Reginald Stephen, to John Ratcliff (Tail Lifts) Limited. Vehicle load lifting and lowering apparatus. 3,945,516, Cl. 214-75.00T.
Peerts, Fernand: *See—*
Delaunois, Yvon; Hestermans, Pierre; Leroy, Georges; Peerts, Fernand; and Wilante, Claude, 3,946,083.
Pelner, Nathan: *See—*
Oltman, Henry G., Jr.; Pelner, Nathan; and Torgow, Eugene N., 3,946,339.
Pelosi, Stanford S., Jr., to Morton-Norwich Products, Inc. 5-phenyl-2-furamidoximes. 3,946,049, Cl. 260-347.200.
Pericic, Ljubomir: *See—*
Crock, Gerard William; and Pericic, Ljubomir, 3,945,712.
Perkins, Stephen P.: *See—*
Wormser, Alex F.; and Perkins, Stephen P., 3,945,244.
Perroud, Paul: *See—*
Allera, Jean-Louis; Bergeri, Jacques; Perroud, Paul; Pleyber, Gaetan; and Violet, Jean-Louis, 3,946,224.
Persson, Adrian, to Raymond Lee Organization Inc., a part interest. Electrolytic cell. 3,945,905, Cl. 204-212.000.
Peter, Richard: *See—*
Angliker, Hans-Jorg; Peter, Richard; and Liechti, Hans Wilhelm, 3,945,989.
Peter, Strong Research and Development Company, Inc.: *See—*
Hill, William H., 3,946,110.
Peters, Jack; and Barrett, DeLoris Joan. Lever actuated brake assembly. 3,945,472, Cl. 188-72.700.
Peters, Richard H.: *See—*
Crowe, David F.; Peters, Richard H.; Tanabe, Masato; and Detre, George, 3,946,052.
Peterson, C. Lynn, to Peterson Filters & Engineering Company. Apparatus for impact discharge of filter cake from a moving filter medium and for compacting filter cake thereon. 3,945,924, Cl. 210-384.000.
Peterson, Carl R., to Rapidex, Inc. Boring apparatus. 3,945,447, Cl. 175-349.000.
Peterson Filters & Engineering Company: *See—*
Peterson, C. Lynn, 3,945,924.
Peterson, Francis C., to C. Hager & Sons Hinge Manufacturing Company. Door exit fixture with pneumatic means for maintaining a latch bolt in its retracted position. 3,945,670, Cl. 292-92.000.
Peterson, John O. H., to Scott Paper Company. Release coating composition and release papers prepared therefrom. 3,946,135, Cl. 428-411.000.
Peth, Horst; and Illetschko, Gerhard, to Robert Bosch Fernsehanlagen GmbH. System for producing a correction signal for the aperture correction of video signals. 3,946,153, Cl. 178-7.100.
Peth, Horst: *See—*
Illetschko, Gerhard; and Peth, Horst, 3,946,152.
Petigara, Ramesh B.: *See—*
Yale, Harry Louis; and Petigara, Ramesh B., 3,946,025.
Pfeifer, Klara, deceased: *See—*
Deak, Gyula; Doda, Margit; Gyorgy, Lajos; Hazai, Laszlo; and Pfeifer, Klara, deceased, 3,946,018.
Pfeifer, Wolf Dieter: *See—*
Asinger, Friedrich; Pfeifer, Wolf Dieter; Offermanns, Heribert; Scherberich, Paul; and Schreyer, Gerd, 3,946,069.
Pfiffner, Albert: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,946,040.
Philip, Morris. Apparatus and method of knitting and elements thereof. 3,945,223, Cl. 66-50.00R.
Philips, William D.; and Franklin, William H., Jr., to Bendix Corporation, The. Phase modulator for phase shift key communications systems. 3,946,337, Cl. 332-22.000.
Phillips Petroleum Company: *See—*
Bost, Howard W., 3,946,030.
Gomory, Paul L., 3,946,096.
Snavely, Kenneth E., 3,945,977.
Phillips Screw Company: *See—*
Flodin, Rodman C., 3,945,071.
Phillips, Wendell Gary, to Monsanto Company. Substituted alpha-chloro-methane-sulfenyl chlorides. 3,946,071, Cl. 260-543.00H.
Philofsky, Elliott M.: *See—*
Greeson, Richard L.; and Philofsky, Elliott M., 3,945,111.
Physicians' Medical Patent Development Corporation: *See—*
Sackner, Marvin A., 3,945,385.
Pierce Chemical Company: *See—*
Vessman, Jorgen; Svahn, Carl Magnus; and Hartvig, Per, 3,946,063.
Pierce, Edward T., to Stanford Research Institute. Trichel pulse corona gas velocity instrument. 3,945,251, Cl. 73-194.00F.
Pierce, Walter C.: *See—*
Lange, George M.; and Pierce, Walter C., 3,946,277.
Pillar Corporation: *See—*
Landis, James P., 3,946,300.
Pillsbury Company, The: *See—*
Cardinal, Thomas J., 3,945,493.
Pimenov, Viktor Alexeevich: *See—*
Kaminsky, Igor Vasilievich; Pimenov, Viktor Alexeevich; and Severov, Genrikh Fedorovich, 3,945,578.
Pioneer Electronic Corporation: *See—*
Ando, Shizuo, 3,946,160.
Piotrowicz, Edward J., Sr. Fuel atomizing device. 3,945,361, Cl. 123-141.000.
Pitney-Bowes, Inc.: *See—*
Marin, Mario J., 3,945,635.
Pittet, Alan Owen: *See—*
Klaiber, Erich Manfred; and Pittet, Alan Owen, 3,946,054.
Platek, Stanley F. Dual action carpet stretcher. 3,945,609, Cl. 254-60.000.
Pleyber, Gaetan: *See—*
Allera, Jean-Louis; Bergeri, Jacques; Perroud, Paul; Pleyber, Gaetan; and Violet, Jean-Louis, 3,946,224.
Poiget, Gilbert: *See—*
Farge, Daniel; Goff, Yves le; Messer, Mayer Naoum; and Poiget, Gilbert, 3,946,019.
Poirier, Alain M.: *See—*
Leclercq, Marc A.; Poirier, Alain M.; and Guichard, Jacques M., 3,946,158.
Polaroid Corporation: *See—*
Hoffman, Arnold, 3,945,849.
Poliak, John M.; and Lopez, Juan M., to Leviton Manufacturing Co., Inc. Twist-type electrical connector with safety interlock. 3,945,702, Cl. 339-88.00R.
Pollack, Slava A.; and Nicolai, Van O., to United States of America, Navy. Nernst lamp for laser pumping. 3,946,331, Cl. 331-94.50P.
Polnauer, Frederick F., deceased; and by Polnauer, Wilmia Marie, executrix. Dual orifice spray nozzle using two swirl chambers. 3,945,574, Cl. 239-404.000.
Polnauer, Wilmia Marie, executrix: *See—*
Polnauer, Frederick F., deceased; and Polnauer, Wilmia Marie, executrix, 3,945,574.
Pomella, Piero; Lauro, Luciano; and Scotti, Pier Gianni, to Ing. C. Olivetti & C., S.p.A. Electroerosion apparatus having a cyclically movable and variably inclined wire electrode. 3,946,189, Cl. 219-69.00E.
Popper, Jakhin Boas; and Lowy, Avigdor, to State of Israel Ministry of Defence Hakirya, The. Projectile fuse. 3,945,324, Cl. 102-78.000.
Poque, Dionysius Josef; Senger, Gerhard Franz-Josef; and Vogler, Hans Jurgen, to Uniroyal Aktiengesellschaft. Reinforcement ply in the form of a belt for pneumatic tires for vehicles. 3,945,421, Cl. 152-361.0FP.
Porret, Daniel; and Habermeier, Jurgen, to Ciba-Geigy Corporation. Adducts of polyglycidyl compounds and dialkoxyphosphono-alkyl derivatives of cyclic ureides. 3,946,034, Cl. 260-309.500.
Pottinger, Marion G., to B. F. Goodrich Company, The. Tire with no ply steer belt. 3,945,422, Cl. 152-361.0DM.
Power, George Edward; and Wulfekotter, Dudley, to Formica Corporation. Machineable decorative laminates. 3,946,137, Cl. 428-452.000.
PPG Industries, Inc.: *See—*
Hedden, Jerry C., 3,946,132.
Levine, Morris; Yurcheshen, Michael; and Hight, Roland W., 3,945,963.
Prather, George A.; and Braschler, Steve A., to Parmac, Inc. Individualized stator and rotor for hydromatic brakes. 3,945,473, Cl. 188-296.000.
Precht, Walter, to Martin Marietta Corporation. Process for treating metal powders. 3,945,863, Cl. 148-126.000.
Prestil: *See—*
Jakob, Horst, 3,945,407.
Preves, David A., to Maico Hearing Instruments Inc. Directional hearing aids. 3,946,168, Cl. 179-107.0FD.
Price, Michael Anthony: *See—*
Cocker, Peter; and Price, Michael Anthony, 3,945,885.
Priefert, Marvin J. Trailer apparatus for loading and transporting a farm unit. 3,945,661, Cl. 280-46.000.
Pritz, Howard B.; and Talbert, Sherwood G., to SmithKline Corporation. Injection device. 3,945,379, Cl. 128-173.00H.
Pritz, Howard B.: *See—*
Bennett, Russell B.; Millicovsky, William; and Pritz, Howard B., 3,945,383.
Procter & Gamble Company, The: *See—*
Lucas, Malcolm Bramel; McKenna, James Francis; and Diehl, Francis Louvaine, 3,945,936.
Prohaska, Hans: *See—*
Eberle, Dieter; Hanselmann, Dieter; and Prohaska, Hans, 3,946,178.
Protective Treatments, Inc.: *See—*
Strack, Donald Robert, 3,945,975.
Protzeller, Harry W. Encapsulated lamp assembly. 3,946,263, Cl. 313-312.000.
Prueitt, Melvin L. Dynamic color pattern generator. 3,945,722, Cl. 353-122.000.
Pryor, Michael J.: *See—*
Winter, Joseph; Pryor, Michael J.; and Setzer, William C., 3,945,860.
Puech, Claude, to Thomson-CSF. Pressing device for manufacturing of storage substrates. 3,945,790, Cl. 425-385.000.
Pulliam, George R.: *See—*
Mee, Jack E.; Heinz, David M.; Hamilton, Thomas N.; Besser, Paul J.; and Pulliam, George R., 3,946,124.
Purdue Research Foundation: *See—*
Hillberry, Benny M.; and Hall, Allen S., Jr., 3,945,053.
Purselley, Audie C. Trotline fishhook holder and dispenser. 3,945,144, Cl. 43-54.50A.

Puyhaubert, Jean: *See*—
Chiron, Bernard; Puyhaubert, Jean; and Seguin, Michel, 3,946,341.
Pylant, Andrew A. Paint brush wiping device. 3,945,527, Cl. 220-90.000.
Pyrotector, Incorporated: *See*—
Malinowski, William J., 3,946,241.
Quante, Hermann, to Wilhelm Quante Spezialmaschinenfabrik fur Apparate der Fernmeldetechnik. Sealed cable junction. 3,946,144, Cl. 174-92.000.
Quick-Rotan Becker & Notz KG: *See*—
de Jong, Wilhelmus Maria, 3,945,476.
Quist, Eric G., to Branson Ultrasonics Corporation. Overload protection circuit. 3,946,280, Cl. 317-31.000.
Quoos, Kurt: *See*—
Kusters, Eduard; and Quoos, Kurt, 3,945,131.
R. D. Products, Inc.: *See*—
Darjany, John C., 3,946,206.
R. T. Vanderbilt Company, Inc.: *See*—
Karsten, Kenneth S.; and Karabinos, Joseph V., 3,946,016.
Rowan, Eugene VanNess, 3,945,938.
Racine Railroad Products, Inc.: *See*—
McIlrath, William P., 3,945,749.
Rack Engineering Company: *See*—
Saul, Samuel, Jr.; and Colbridge, Thomas D., 3,945,510.
Radda, Herbert: *See*—
Habock, Adolf; Beckmann, Oskar; Frese, Stefan; Radda, Herbert; Mayerhofer, Franz; and Leowald, Karl-Friedrich, 3,946,389.
Ragard, Phillip A.: *See*—
Whiting, Roy M.; Soth, Henry J.; and Ragard, Phillip A., 3,945,100.
Ragone, David V.; and Simnad, Massoud T., to General Atomic Company. Refractory carbide particles with thin outer layer of highly crystalline carbon. 3,945,629, Cl. 269-.500.
Rak, Jaromir R.: *See*—
Clarke, Michael R.; and Rak, Jaromir R., 3,945,835.
Rakow, Marvin S.: *See*—
Robinson, Franklin H.; Rakow, Marvin S.; and Jamieson, Ernest, 3,946,053.
Ralph M. Parsons Co., The: *See*—
Barry, Charles B., 3,945,435.
Ralston Purina Company: *See*—
Brever, Leslie H.; and Steinke, Frederick H., 3,946,115.
Ramanathan, Visvanathan; and Liechti, Hans Wilhelm, to Ciba-Geigy AG. Heterocyclic azo compounds containing a quaternated hydrazide group. 3,945,991, Cl. 260-162.000.
Rambach, Gerry. Snow making apparatus. 3,945,567, Cl. 239-14.000.
Ramer, Paul C., to Alpine Research, Inc. Ski boot. 3,945,134, Cl. 36-2.5AL.
Ramig, Alexander, Jr.; and Bowell, Stephen T., to SCM Corporation. Mixtures of titanium dioxide and porous synthetic magnesium silicate in opacified emulsion paints. 3,945,965, Cl. 260-29.6MM.
Randmer, Jacob A.: *See*—
Holland, William P.; Swanson, Capleton I.; and Randmer, Jacob A., 3,946,261.
Randolph, Michael M.: *See*—
Bell, Charles Gilbert; and Randolph, Michael M., 3,945,265.
Rangabe, Alexander R. Cleaning gramophone records. 3,945,647, Cl. 274-47.000.
Rank Xerox Ltd.: *See*—
Thorp, Peter M., 3,946,172.
Rapidex, Inc.: *See*—
Peterson, Carl R., 3,945,447.
Rash, James E. Self-contained portable pressure apparatus and hand gun assembly. 3,945,571, Cl. 239-152.000.
Rautenstrauch, Valentin; and Naf, Ferdinand, to Firmenich SA. Cycloaliphatic unsaturated ketones as odour- and taste-modifying agents. 3,946,078, Cl. 260-586.00R.
Raychem Corporation: *See*—
Siden, Dennis Carl; and McMills, Corey John, 3,945,114.
Raychem Limited: *See*—
McLoughlin, Robert H., 3,946,143.
Raymond Lee Organization Inc.: *See*—
Persson, Adrian, 3,945,905.
Raytheon Company: *See*—
Derby, Palmer P., 3,946,188.
Dunne, Thomas P.; and Ruggiero, Richard D., 3,946,393.
MacMaster, George H.; and Dudley, Kenneth W., 3,946,187.
Razdan, Raj Kumar: *See*—
Winn, Martin; Razdan, Raj Kumar; Dalzell, Haldean Cloyce; and Krei, Joyce Ruth, 3,946,111.
RCA Corporation: *See*—
Dietz, Wolfgang Friedrich Wilhelm, 3,946,274.
Feldstein, Nathan, 3,946,126.
Gale, Michael Thomas; and Firester, Arthur Herbert, 3,945,825.
Goldsmith, Norman; and Robinson, Paul Harvey, 3,945,864.
Hawrylo, Frank Zygmunt; and Kressel, Henry, 3,945,902.
Hsu, Sheng Teng, 3,946,327.
Kessler, Sebastian William, Jr., 3,946,429.
Leidich, Arthur John, 3,946,325.
Lippman, Michael David, 3,946,379.
Reactor Centrum Nederland (Stichting): *See*—
van Beijnen, Christianus Antonius Maria, 3,945,859.
Realty & Industrial Corporation: *See*—
Gubelmann, William S., deceased; Gubelmann, Walter S., executor; and Grier, William R., 3,945,480.
Reber, Heinrich: *See*—
Mayer, Cornelius; Diewald, Gunther; and Reber, Heinrich, 3,945,321.
Rebold, Jerome I., to Becton, Dickinson and Company. Multiple shot pipetter. 3,945,254, Cl. 73-425.600.
Recognition Equipment Incorporated: *See*—
Hecht, Richard M.; and Wiegman, William B., 3,946,203.
Record Taxameter AB: *See*—
Borgstrom, Lennart Carl Gote, 3,946,208.
Redactron Corporation: *See*—
Marino, Francis C., 3,946,275.
Reedy, James Dale, to Union Carbide Corporation. Preparation of metal complexes of 1,3-diketones. 3,946,057, Cl. 260-439.00R.
Rees, J. Samuel: *See*—
McGehee, C. Bernie; Rees, J. Samuel; and Johnson, Luther J., Jr., 3,945,277.
Regie Nationale des Usines Renault: *See*—
Calviac, Jean-Pierre, 3,945,355.
Miokovic, Stevan, 3,945,221.
Regueiro, Jose F., to Teledyne Industries, Inc. Low emission combustion system for internal combustion engine using multiple spark. 3,945,365, Cl. 123-191.000.
Reiland, Peter M. Protective bracket. 3,945,227, Cl. 70-58.000.
Reimuller, Christian J., to Foundation for Research and Engineering Education. Fuel vaporization and injection system for internal combustion engine. 3,945,352, Cl. 123-34.00A.
Reinicke, Robert H.; and Kenyon, Richard L., to Parker-Hannifin Corporation. Vent and relief valve. 3,945,395, Cl. 137-495.000.
Reinke, Friedhelm; Stengel, Edgar; Emde, Friedhelm; and Schwarz, Hans Rudolf, to AEG-Elotherm. Device for treating production parts, especially for inductive hardening of the parts. 3,945,483, Cl. 198-21.000.
Republikanski Centar sa TNTM: *See*—
Chitakyan, Onik Kevork; and Shterev, Mihail Georgiev, 3,946,333.
Resch, Richard J.: *See*—
Hendrickson, Philip J.; and Resch, Richard J., 3,945,328.
Ressorts Du Nord S. A.: *See*—
Duchemin, Michel, 3,945,625.
Rexnord, Inc.: *See*—
Dieringer, Andrew M., 3,946,284.
Reynolds, Blake: *See*—
Marion, Charles P.; and Reynolds, Blake, 3,945,942.
Reynolds Metals Company: *See*—
Givens, Travis R., 3,945,906.
Rhee, Jhoon Goo. Protective device for a person's rib cage area. 3,945,041, Cl. 2-2.000.
Rhee, Jhoon Goo. Protective glove for the hand. 3,945,045, Cl. 2-16.000.
Rheinische Chamotte - und Dinas Werke: *See*—
Gelon, Robert, 3,945,766.
Rhoads, Kenneth A.: *See*—
Booth, Sterling R., Jr.; and Rhoads, Kenneth A., 3,945,693.
Rhone-Poulenc, S.A.: *See*—
Farge, Daniel; Goff, Yves le; Messer, Mayer Naoum; and Poiget, Gilbert, 3,946,019.
Gruffaz, Max; and Rollet, Bernard, 3,945,999.
Rhone-Poulenc Textile: *See*—
Billet, Lucien; and Lartigau, Guy, 3,946,070.
Goletto, Jean, 3,945,968.
Rhone-Poulenc-Textile SA: *See*—
Vidal, Roger; and Gourmandy, Raymond, 3,946,133.
Richardson-Merrell Inc.: *See*—
Albrecht, William L.; and Fleming, Robert W., 3,946,021.
Carr, Albert A.; and Kinsolving, C. Richard, 3,946,022.
Metcalf, Brian Walter; and Jung, Michel, 3,946,060.
Shemano, Irving, 3,946,112.
Richardson, Reginald Stephen: *See*—
Peck, Albert William; and Richardson, Reginald Stephen, 3,945,516.
Richmond Manufacturing Company, The: *See*—
Barnes, Thomas W., 3,945,443.
Richter, Sidney B.; and Krenzer, John, to Velsicol Chemical Corporation. N-alpha-chlordacetyl-N-(1,3-dioxan-2-ylmethyl)-2,6-dimethylaniline. 3,946,043, Cl. 260-340.700.
Richter, Sidney B.; and Krenzer, John, to Velsicol Chemical Corporation. N-alpha-chloroacetyl-n-(1,3-dioxolan-2-ylmethyl)-2-ethyl-6-methylaniline. 3,946,044, Cl. 260-340.900.
Richter, Sidney B.; and Krenzer, John, to Velsicol Chemical Corporation. Dioxolane substituted anilids. 3,946,045, Cl. 260-340.900.
Rickerd, Calvin P.: *See*—
Barkstrom, Reynold; Rickerd, Calvin P.; and Swanson, William C., 3,945,175.
Riedel, Albert F., to Hoerbiger Ventilwerke Aktiengesellschaft. Plate valve. 3,945,397, Cl. 137-514.000.
Rigassi, Norbert: *See*—
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,946,040.
Rikagaku Kenkyusho: *See*—
Honma, Haruo, 3,945,799.
Rim, Ho Yon. Steering wheel cover. 3,945,416, Cl. 150-52.00M.
Rittenbaum, Jeffrey A.: *See*—
Rittenbaum, Max; and Rittenbaum, Jeffrey A., 3,945,736.
Rittenbaum, Max; and Rittenbaum, Jeffrey A. Extension mop. 3,945,736, Cl. 401-289.000.

Ritter, Klaus: *See—*
Scherr, Rudolf; Jamnig, Walter; Gott, Hans; and Ritter, Klaus, 3,945,409.

Ritz, Alan J., to Milwaukee Electric Tool Corporation. Vibration dampening and heat sink mechanism for a reciprocating power saw. 3,945,120, Cl. 30-393.000.

Rixon, Incorporated: *See—*
Stuart, Richard L.; and Bhopale, Arvind M., 3,946,214.

Robert Bosch Fernsehanlagen GmbH: *See—*
Peth, Horst; and Illetschko, Gerhard, 3,946,153.

Robert Bosch GmbH: *See—*
Eckert, Konrad, 3,945,802.
Falchle, Jorg, 3,945,653.
Knapp, Heinrich, 3,945,204.
Laufer, Helmut, 3,945,360.
Stahle, Eugen; and Frauhammer, Karl, 3,945,259.
Streit, Klaus; and Staiger, Karl, 3,946,303.
Vlemmings, Jan; and Dworak, Wilhelm, 3,945,779.

Roberts, Patrick A. Tangential spheres geometric puzzle. 3,945,645, Cl. 273-157.00R.

Roberts, Thomas G.; Shatas, Romas A.; Meyer, Harry C., III; and Stetler, John D., to United States of America, Army. Energetic electron beam assisted X-ray generator. 3,946,236, Cl. 250-402.000.

Roberts, Thomas G.; Shatas, Romas A.; Meyer, Harry C., III; and Stetler, John D., to United States of America, Army. Energetic electron beam assisted fusion neutron generator. 3,946,240, Cl. 250-493.000.

Robertshaw Controls Company: *See—*
Rosenfeld, Jacob R., 3,945,257.

Robertson, Jack L., Jr. Closure cap. 3,945,526, Cl. 215-302.000.

Robertson, John R., to Uniroyal, Inc. Light stable polyurethane elastomer prepared from aliphatic isocyanate using thio tin organic compound containing sulfur attached to tin as heat activated catalyst. 3,945,981, Cl. 260-75.0NB.

Robins, Charles T.: *See—*
Gryctko, Carl E.; and Robins, Charles T., 3,946,345.

Robinson, Franklin H.; Rakow, Marvin S.; and Jamieson, Ernest, to Cities Service Oil Company. Hydrocarbyl hydrogen phosphate salts of amino-amides. 3,946,053, Cl. 260-404.500.

Robinson, Paul Harvey: *See—*
Goldsmith, Norman; and Robinson, Paul Harvey, 3,945,864.

Robinson, Ralph J. Sound speaker system. 3,945,461, Cl. 181-153.000.

Robison, James Ray, to International Telephone & Telegraph Corporation. Process control system. 3,945,904, Cl. 204-195.00T.

Robison, Leslie P., to United States of America, Navy. Solenoid. 3,945,295, Cl. 89-1.50D.

Rochester, Lincoln First Bank of, executor: *See—*
Sullivan, William A., Jr.; and Eichorn, Roger H., deceased, 3,946,230.

Rockwell International Corporation: *See—*
Henry, Rodney D.; Besser, Paul J.; and Warren, Robert G., 3,946,372.
Mee, Jack E.; Heinz, David M.; Hamilton, Thomas N.; Besser, Paul J.; and Pulliam, George R., 3,946,124.

Rode, France; Crowley, William L., Jr.; Walker, Alexander D. R.; and Cochran, David S., to Hewlett-Packard Company. General purpose calculator with capability for performing yield-to-maturity of a bond calculation. 3,946,218, Cl. 235-156.000.

Rodina Energy R & D Corporation: *See—*
Chapin, Bryan W., 3,945,210.

Rodionov, Vitaly Petrovich: *See—*
Listov, Petr Nikolaevich; Ganiev, Madzhid Saidovich; Buromsky, Vladimir Ivanovich; Bogdanova, Lidia Ivanovna; Kalafatov, Enver Tefikovich; Topalidi, Dmitry Nikolaevich; Rodionov, Vitaly Petrovich; Junusov, Edem Idrisovich; and Fedorov, Valery Pavlovich, 3,945,179.

Rodriguez, Emilio Retana: *See—*
Baez Rios, Guillermo, 3,945,289.

Roehm, Jack M.: *See—*
Grosser, Christian E.; and Roehm, Jack M., 3,945,160.

Rogers, Meyric K.: *See—*
Waters, Robert S.; and Rogers, Meyric K., 3,946,196.

Rogers, Ralph W., Jr.: *See—*
Anderson, William A.; Rogers, Ralph W., Jr.; and Vernam, William D., 3,945,861.

Rogers, Robert N.; and Saar, Michael O., to Eaton Corporation. Modular water filter. 3,945,923, Cl. 210-253.000.

Rohlin, William F. Ski binding. 3,945,656, Cl. 280-11.35D.

Rohm and Haas Company: *See—*
Beasley, Glenn H.; and Cartier, Peter G., 3,945,811.

Rohr, Wolfgang: *See—*
Fischer, Adolf; and Rohr, Wolfgang, 3,946,048.

Rohte, Oskar: *See—*
Tauscher, Manfred; Goring, Joachim; Busch, Wolfgang; and Rohte, Oskar, 3,946,013.

Rokadia, Abdullah M., to DeSoto, Inc. Damper apparatus. 3,945,767, Cl. 417-313.000.

Rokohl, Rudolf; Fikentscher, Rolf; and Helfert, Herbert, to BASF Aktiengesellschaft. Production of level dyeings on acrylonitrile polymer fibers with basic dyes. 3,945,794, Cl. 8-172.00R.

Rolleman, Geert: *See—*
den Hertog, Willem Cornelis; and Rolleman, Geert, 3,945,621.

Rollet, Bernard: *See—*
Gruffaz, Max; and Rollet, Bernard, 3,945,999.

Romian, Edward. Sausage stuffing machine. 3,945,082, Cl. 17-33.000.

Ronay, Bela: *See—*
Mote, Harold Trevor; Hajdu, Laszlo; and Ronay, Bela, 3,945,851.

Roncato, Giordano, to Saint-Gobain Industries. Apparatus for cutting thread. 3,945,280, Cl. 83-98.000.

Roos, Charles J. Apparatus for combined protection against nuclear fallout and nuclear suffocation. 3,945,800, Cl. 23-232.00R.

Rosen, Charles A., to Stanford Research Institute. Combined ranging and color sensor. 3,945,729, Cl. 356-5.000.

Rosenbaum, Heinz Jorg: *See—*
Thiel, Reinhard; Rosenbaum, Heinz Jorg; and Heller, Karl Heinz, 3,946,077.

Rosenfeld, Jacob R., to Robertshaw Controls Company. Force balance transmitter and method of making the same. 3,945,257, Cl. 74-17.800.

Rossi, Eugene F., to Allis-Chalmers Corporation. Reduction kiln having a controllable distribution system. 3,945,624, Cl. 266-20.000.

Rossi, Irving. Method of straightening a continuously cast strand. 3,945,424, Cl. 164-89.000.

Rossi, John P.: *See—*
Goldberg, Abraham A.; and Rossi, John P., 3,946,432.

Rossmann, Axel; and Hagemeister, Klaus, to Motoren-und Turbinen Union Munich GmbH. Rotor wheel for radial-flow fans and turbines and method and fixture for making same. 3,945,101, Cl. 29-156.8CF.

Rotec Industries: *See—*
Oury, Robert F., 3,945,484.

Roughton, Charles Lyn; and Ellis, Christopher Ian Arthur. Cell for measuring electrical resistivity of a liquid. 3,946,309, Cl. 324-64.000.

Roussin, Alfred G., to General Electric Company. Reduced initial delay in projecting high quality images from a fluid light valve. 3,946,154, Cl. 178-7.50D.

Rowan, Eugene VanNess, to R. T. Vanderbilt Company, Inc. Antibacterial dithiocarbamate ester detergent compositions. 3,945,938, Cl. 252-107.000.

Rowe, Bernard D. Vacuum engine. 3,945,211, Cl. 60-649.000.

Rowley, Edward C. Knock-down reusable column form. 3,945,601, Cl. 249-48.000.

Rudder, Walter H.; Braden, William D., deceased (by Braden, Anna P., executrix); McEvoy, Charles J.; Dodson, Stokes R., Jr.; Thiele, John R.; and Livgren, Allen L., to Goodyear Tire & Rubber Company, The. Tire building apparatus for large tires. 3,945,866, Cl. 156-126.000.

Rudolph Beaver, Inc.: *See—*
Beaver, John R., 3,945,117.

Rudolph, Peter: *See—*
Hahn, Guenter; Lampe, Hans Hermann; and Rudolph, Peter, 3,946,378.

Ruegg, Edwin, to Maschinenfabrik u.Giesserei Netstal AG. Plastic injection molding machine. 3,945,620, Cl. 259-191.000.

Ruggiero, Richard D.: *See—*
Dunne, Thomas P.; and Ruggiero, Richard D., 3,946,393.

Rumpf, Robert John: *See—*
Willey, Ronald Albert; and Rumpf, Robert John, 3,945,587.

Russell, Frank S., to Sleeper & Hartley Corporation. Metal forming machine with multiple extended beds. 3,945,239, Cl. 72-452.000.

Rutgers Research and Educational Foundation: *See—*
Schaffner, Carl P.; and Mechlinski, Witold, 3,945,993.

Ruthner Industrieanlagen-Aktiengesellschaft: *See—*
Krause, Alfred Walter Joachim, deceased, 3,945,206.

Rutkowski, Robert: *See—*
Hoagland, John C.; Rutkowski, Robert; and Yonko, Jon D., 3,945,682.

Rutman, Grigory Iosifovich: *See—*
Gershanov, Felix Borisovich; Liakumovich, Alexandr Grigorievich; Michurov, Jury Ivanovich; Pantukh, Boris Izrailevich; Rutman, Grigory Iosifovich; Sobolev, Valerian Mikhailovich; Grinberg, Alexandr Afroimovich; Gurvich, Yakov Abramovich; Zakharova, Nina Vasilievna; and Nafikova, Almira Mudarisovna, 3,946,086.

Rutten, Pierre Jean: *See—*
Noe, Robert Joseph; and Rutten, Pierre Jean, 3,946,140.

Ruttershoff, Heinz Joachim, to O & K Orenstein & Koppel Aktiengesellschaft. Brake for cushioning pendulum movements, especially for grab buckets of hydraulically operable earth dredges. 3,945,137, Cl. 37-183.00R.

Ryder, Francis E.; and Mueller, Theodore H., to Ryder International Corporation. Illuminating magnifying lens structure. 3,945,717, Cl. 350-237.000.

Ryder International Corporation: *See—*
Ryder, Francis E.; and Mueller, Theodore H., 3,945,717.

S-P Manufacturing Corporation, The: *See—*
Ovanin, George J., 3,945,275.

Saab-Scania Aktiebolag, Sodertalje: *See—*
Wahlqvist, Hans Sigvard, 3,945,429.

Saar, Michael O.: *See—*
Rogers, Robert N.; and Saar, Michael O., 3,945,923.

Sackner, Marvin A., to Physicians' Medical Patent Development Corporation. Suction catheter. 3,945,385, Cl. 128-350.00R.

Safe Flight Instrument Corporation: *See—*
Greene, Leonard M., 3,946,394.

Sailor Pen Co., Ltd., The: *See—*
Nakashiki, Koso; Yoshimoto, Akira; and Osaki, Kazuhiko, 3,945,735.

Saint-Gobain Industries: *See—*
Roncato, Giordano, 3,945,280.

Saito, Kiyosi, to Agency of Industrial Science and Technology. Apparatus for disposal of plastics. 3,945,810, Cl. 48-76.000.

Saito, Takeshi, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Dual erasing core structure for selectively erasing adjacent recording. 3,946,440, Cl. 360-118.000.

Saito, Tamotsu: *See—*
Matsuura, Takashi, 3,945,063.

Saito, Tsunenari; and Aoki, Yoshio, to Sony Corporation. Electrostatic and dynamic magnetic control of cathode ray for distortion compensation. 3,946,266, Cl. 313-442.000.

Saito, Yoshihiro: *See—*
Yagi, Hajime; Saito, Yoshihiro; and Hirano, Koji, 3,946,422.

Sakai, Isao. Process for retaining freshness of fruits, vegetables and cereals. 3,946,118, Cl. 426-321.000.

Sakai, Shoji: *See—*
Matsui, Isamu; Sakai, Shoji; Tsukada, Susumu; and Kawarabayashi, Susumu, 3,945,488.

Sakai, Tadao; Kawai, Masayoshi; Yamamoto, Nobuo; and Yoneyama, Masakazu, to Fuji Photo Film Co., Ltd. Process for forming optical sound track. 3,945,824, Cl. 96-4.000.

Sakai, Toshiyuki; Miyazaki, Kazuhide; and Yamamoto, Michiaki, to Mitsui Mining & Smelting Co., Ltd. Catalyst for purifying exhaust gases. 3,945,947, Cl. 252-466.00B.

Sakamoto, Kazuhiko, to Nitto Kasei Co. Ltd.; and Osaka Soda Co. Ltd. Curable epoxy resin composition comprising an epoxy resin and a reactive diluent. 3,945,972, Cl. 260-47.0EP.

Sakata, Hiroshi; Okamoto, Takashi; and Hasegawa, Hirozo, to Unitika Limited. Aromatic co-polyester articles showing reduced crazing. 3,946,091, Cl. 260-860.000.

Sakura Color Products Corporation: *See—*
Miyata, Fumio, 3,945,836.
Miyata, Fumio; and Okuda, Yasuji, 3,945,837.

Salminen, Christopher: *See—*
McMullen, Galen B., 3,945,654.

Salmond, William G., to Sandoz, Inc. Antiinflammatory and analgesic cycloalkano-pyrimidin-2(1H)-ones. 3,945,960, Cl. 260-251.00A.

Salvarezza, Robert M. Quick-release storage of a life ring and lifebuoy markers. 3,945,067, Cl. 9-14.000.

Salzman, Gary C.; and Mullaney, Paul F., to United States of America, United Energy Research and Development Administration. Ellipsoidal cell flow system. 3,946,239, Cl. 250-461.00B.

Samis, Michael A. High power density continuous wave plasma glow jet laser system. 3,946,332, Cl. 331-94.5PE.

Samoilov, Oleg Borisovich: *See—*
Derevyankin, Nikolai Efimovich; Evseev, Vladimir Ivanovich; Zhuchkov, Ivan Ilich; Samoilov, Oleg Borisovich; and Ovechkin, Alexandr Vasilievich, 3,945,886.

Sanchez, Mario C. Zamorano: *See—*
Daran, Jose Luis Davila; Sanchez, Mario C. Zamorano; and Hernandez, Antonio Ovando, 3,945,094.

Sandco Limited: *See—*
Boman, Karl Gunnar, 3,945,789.

Sander, Glen L. Fly tying vise. 3,945,631, Cl. 269-131.000.

Sanders Associates, Inc.: *See—*
Edwards, Howard W., Jr., 3,946,366.

Sanders, Thomas J., to Harris Corporation. Interconnect system for integrated circuits. 3,946,426, Cl. 357-71.000.

Sanderson, Jeffrey P. Self-oscillating fan. 3,945,769, Cl. 417-361.000.

Sando, Shigeru: *See—*
Anazawa, Shinzo; Ueno, Seiichi; Nagasako, Isamu; Nawa, Tadashi; Irie, Toshiaki; and Sando, Shigeru, 3,946,428.

Sandoz, Inc.: *See—*
Kathawala, Faizulla G., 3,946,119.
Salmond, William G., 3,945,960.

Sandoz Ltd.: *See—*
Gadient, Fulvio, 3,946,036.

Sangamo Weston Limited: *See—*
McBride, Maurice Graham; and Gray, Bernard Herbert Leslie, 3,946,259.

Sankyo Electric Co., Ltd.: *See—*
Toyoda, Hiroshi; Shimizu, Shigemi; Terauchi, Kiyoshi; and Hiraga, Masaharu, 3,945,765.

Sanwa Machine Co., Inc.: *See—*
Suzuki, Masahiko; Motomura, Takayuki; Seko, Kiyoshi; and Takahashi, Hiroshi, 3,945,614.

Saper, Barry M.; and Lam, Tim Yee, to Fluke Trendar Corporation. Logic test unit. 3,946,310, Cl. 324-72.500.

Sasaki, Ichiemon: *See—*
Nishizawa, Jun-ichi; Sasaki, Ichiemon; Ishida, Katsuhiko; Tauchi, Syoji; Nishimura, Takeshi; Seki, Takeo; and Kozuma, Noboru, 3,946,270.

Sasaki, Toshiharu: *See—*
Nakajima, Yasutaka; Sasaki, Toshiharu; and Katakabe, Noboru, 3,945,727.

Sato, Eiichi: *See—*
Nagai, Hidetaka; Sato, Eiichi; and Kobayashi, Fujio, 3,946,105.

Sato, Goro, to Hokuetsu Kogyo Co. Ltd. Oil-injection-type rotary compressor having a centrifugal water separator. 3,945,464, Cl. 184-6.160.

Sato, Minoru: *See—*
Yoshioka, Tsunehiko; Oyamada, Yasutaka; Iwaya, Shoichi; and Sato, Minoru, 3,946,290.

Sato, Tetsuo: *See—*
Matsuura, Takashi, 3,945,063.

Sato, Tutomu; Horikawa, Kiyomi; Hiroi, Masayoshi; Umino, Shigeyuki; Yamada, Toshio; Takayama, Takashi; and Kayamori, Toru, to Max Kabushiki Kaisha. Nailing machine. 3,945,551, Cl. 227-136.000.

Satomura, Masato, to Fuji Photo Film Co., Ltd. Photosensitive resins containing a thienylacrylic acid ester or amide group. 3,945,831, Cl. 96-86.00P.

Sauer, Hans, to Matsushita Electric Works Ltd. Electromagnetic relay structure. 3,946,347, Cl. 335-202.000.

Saul, Samuel, Jr.; and Colbridge, Thomas D., to Rack Engineering Company. Storage equipment. 3,945,510, Cl. 214-16.40A.

Saygin, Ferdi: *See—*
Conrad, Jens; Eckert, Hans Werner; Saygin, Ferdi; and Schnegelberger, Harald, 3,945,996.

Schaffner, Carl P.; and Mechlinski, Witold, to Rutgers Research and Educational Foundation. Derivatives of polyene macrolide antibiotics. 3,945,993, Cl. 260-210.0AB.

Schalling, Hans Erik Otto: *See—*
Linden, Sven-Erik; and Schalling, Hans Erik Otto, 3,945,198.

Schanzer, Gunther W., to Bodenseewerk Geratetechnik GmbH. Flight control apparatus. 3,945,593, Cl. 244-77.00D.

Scharp, Jacob Arie, to Lever Brothers Company. Process of preparing margarine products. 3,946,122, Cl. 426-604.000.

Schefczik, Ernst; and Kast, Hellmut, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Lactones of the benzaxanthere series and dye-forming components for use in duplication processes. 3,946,017, Cl. 260-287.00C.

Scheffler, Friedrich, to AEG-Elotherm GmbH. Gravity discharge furnace for heating production parts. 3,945,513, Cl. 214-23.000.

Scheiber, Werner, to Metallgesellschaft Aktiengesellschaft. Method for internally coating ducts with synthetic resin. 3,946,125, Cl. 427-46.000.

Schelkmann, Wilhelm, to Vakuum Vulk Holdings Ltd. Method of making a tread for the recapping of tires. 3,945,871, Cl. 156-212.000.

Scherberich, Paul: *See—*
Asinger, Friedrich; Pfeifer, Wolf Dieter; Offermanns, Heribert; Scherberich, Paul; and Schreyer, Gerd, 3,946,069.

Scherr, Rudolf; Jamnig, Walter; Gott, Hans; and Ritter, Klaus, to EVG Entwicklungs- und Verwertungs-Gesellschaft m.b.H. Device for feeding lengths of wire to a processing machine. 3,945,409, Cl. 140-112.000.

Scheurer, Philippe. Feed apparatus for automatic lathe. 3,945,506, Cl. 214-1.200.

Schibbye, Hjalmar, to Svenska Rotor Maskiner Aktiebolag. Refrigeration systems. 3,945,216, Cl. 62-84.000.

Schick Incorporated: *See—*
Waters, Robert S.; and Rogers, Meyric K., 3,946,196.

Schifrine, Jean, to Electronique Marcel Dassault. System for and method of analyzing electromagnetic waves. 3,946,388, Cl. 343-113.00R.

Schindewolf, Ulrich, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the environmentally favorable destruction of solid and/or liquid cyanide waste. 3,945,919, Cl. 210-50.000.

Schinella, Richard D.; and Anthony, Michael P., to Fairchild Camera and Instrument Corporation. Method for fabricating double-diffused, lateral transistors. 3,945,857, Cl. 148-1.500.

Schippers, Heinz; and Lenk, Erich, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Winding mechanisms with friction drive rollers. 3,945,579, Cl. 242-18.0DD.

Schippers, Heinz; and Lenk, Erich, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. High-speed cross-winding device. 3,945,581, Cl. 242-43.00R.

Schlaich, Jorg: *See—*
Mayr, Gunter; and Schlaich, Jorg, 3,945,106.

Schleich, Armin, to BBC Aktiengesellschaft Brown, Boveri & Cie. Radiation resistant ducted superconductive coil. 3,946,348, Cl. 335-216.000.

Schloemann-Siemag Aktiengesellschaft: *See—*
Leiste, Hans Peter; and Eckardt, Helmut, 3,945,535.

Schlueter, Ernest, to Simmons Fastener Corporation. Shelf support member. 3,945,595, Cl. 248-239.000.

Schmidt, Fritz, to Siemens Aktiengesellschaft. Cooling apparatus for an electric cable. 3,946,141, Cl. 174-11.00R.

Schmidt, Klaus Peter; and Hill, Bernhard, to U.S. Philips Corporation. Method of making light-dot distribution for the holographic storage of binary information with the aid of electronically controlled switching masks. 3,946,370, Cl. 340-173.0LM.

Schmidt, Richard, to United States of America, Navy. Production of beryllium reinforced composite solid and hollow shafting. 3,945,555, Cl. 228-126.000.

Schmidt, Ronald Vernon, to Bell Telephone Laboratories, Incorporated. Acoustic wave devices involving perturbation of acoustic velocity by diffusion of metals. 3,946,338, Cl. 333-30.00R.

Schmidt, Warren H. D., to Fiberglas Canada Limited. Apparatus for drawing fibers by fluid means. 3,945,815, Cl. 65-12.000.

Schmidt, William G.: *See—*
Husted, John M.; Gabbard, Ova Gene; and Schmidt, William G., 3,946,161.

Schmitt, Anthony S., Sr. Fishing pole holder. 3,945,143, Cl. 43-17.000.

Schnegelberger, Harald: *See—*
Conrad, Jens; Eckert, Hans Werner; Saygin, Ferdi; and Schnegelberger, Harald, 3,945,996.

Schneider Tool and Manufacturing Co.: *See—*
Hubschmitt, Richard W., 3,945,878.

Scholten, Frank L., to Addressograph-Multigraph Corporation. Photocomposer motor speed control. 3,946,294, Cl. 318-313.000.

Scholtholt, Hans: *See—*
Steiner, Ewald; and Scholtholt, Hans, 3,945,706.

Scholz, Kenneth D.: *See—*
Kovalick, Albert W.; and Scholz, Kenneth D., 3,946,302.

Scholze, Herbert: *See—*
Hahn, Werner; Scholze, Herbert; and Seifert, Rolf, 3,946,412.
Schonherr, Werner: *See—*
Jagusch, Leonhard; and Schonherr, Werner, 3,945,922.
Schonhorn, Harold; Sessler, Gerhard Martin; and West, James Edward, to Bell Telephone Laboratories, Incorporated. Technique for fabrication of foil electret. 3,945,112, Cl. 29-592.000.
Schreyer, Gerd: *See—*
Asinger, Friedrich; Pfeifer, Wolf Dieter; Offermanns, Heribert; Scherberich, Paul; and Schreyer, Gerd, 3,946,069.
Schroeder, Robert P.: *See—*
Lukes, Jerome A.; and Schroeder, Robert P., 3,945,880.
Schubert & Salzer Maschinenfabrik Aktiengesellschaft: *See—*
Landwehrkamp, Hans; and Niestroj, Heinz, 3,945,183.
Schultz, Bodo, to TED Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec. High density recording playback element construction. 3,946,167, Cl. 179-100.41P.
Schumag Schumacher Metallwerke GmbH: *See—*
Wetzels, Walter; and Greven, Johann, 3,945,284.
Schumann, Gunter: *See—*
Boehme, Dietrich; Hahn, Gunter; Schumann, Gunter; Wienen, Walter; and Jung, Rolf, 3,945,279.
Schuster, Erich: *See—*
Jacoby, Hans-Dieter; and Schuster, Erich, 3,945,124.
Schwan, Thomas J., to Morton-Norwich Products, Inc. 2-Aminomethylene-1-phenyl-1,3-butanedione. 3,946,075, Cl. 260-570.50C.
Schwarcz, Joseph; Engelbart, Bernard; and White, Edward L., to N L Industries, Inc. Smoke suppressants for halogen-containing plastic compositions. 3,945,974, Cl. 260-31.80R.
Schwarz, Hans Rudolf: *See—*
Reinke, Friedhelm; Stengel, Edgar; Emde, Friedhelm; and Schwarz, Hans Rudolf, 3,945,483.
Schwieter, Ulrich: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,946,040.
SCI Systems, Inc.: *See—*
McMillian, Lonnie S.; and Frohwein, George E., 3,946,374.
SCM Corporation: *See—*
Ramig, Alexander, Jr.; and Bowell, Stephen T., 3,945,965.
Scott, Donald Alan; and Hudson, Colin, to F. M. McConnell Ltd. Method and apparatus for cutting sugar cane. 3,945,177, Cl. 56-12.700.
Scott Paper Company: *See—*
Peterson, John O. H., 3,946,135.
Scott USA: *See—*
McGee, Charles D.; and French, Charles S., 3,945,044.
Scotti, Pier Gianni: *See—*
Pomella, Piero; Lauro, Luciano; and Scotti, Pier Gianni, 3,946,189.
Sears, Stephan B.: *See—*
Kyser, Edmond L.; and Sears, Stephan B., 3,946,398.
Sebenda, Jan: *See—*
Bukac, Zbynek; and Sebenda, Jan, 3,945,984.
Sebring, Michael: *See—*
Blair, James M.; Sebring, Michael; Underwood, Warren H.; and Bley, William P., 3,946,117.
Seguin, Michel: *See—*
Chiron, Bernard; Puyhaubert, Jean; and Seguin, Michel, 3,946,341.
Seiberling, Dale A., to Economics Laboratory, Inc. Continuous separating and standardizing of milk. 3,946,113, Cl. 426-231.000.
Seifert, Arthur. Railway vehicle. 3,945,326, Cl. 105-215.00C.
Seifert, Rolf: *See—*
Hahn, Werner; Scholze, Herbert; and Seifert, Rolf, 3,946,412.
Seiko Koki Kabushiki Kaisha: *See—*
Kitai, Kiyoshi, 3,946,414.
Onda, Eiichi; Koyama, Mitsuo; and Nakagawa, Tadashi, 3,946,413.
Seim, William J.; and Kahabka, Richard D., to Minnesota Mining and Manufacturing Company. Wire-splicing apparatus and contact element therefor. 3,945,705, Cl. 339-98.000.
Seiscom Delta Inc.: *See—*
Anstey, Nigel A., 3,946,356.
Seki, Takeo: *See—*
Nishizawa, Jun-ichi; Sasaki, Ichiemon; Ishida, Katsuhiko; Tauchi, Syoji; Nishimura, Takeshi; Seki, Takeo; and Kozuma, Noboru, 3,946,270.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Ueda, Harutoshi; Suzuki, Naoyuki; and Nagao, Masami, 3,945,840.
Seko, Kiyoshi: *See—*
Suzuki, Masahiko; Motomura, Takayuki; Seko, Kiyoshi; and Takahashi, Hiroshi, 3,945,614.
Sellers, Kenneth W., to Frito-Lay, Inc. System for package weight control. 3,945,448, Cl. 177-25.000.
Seltzer, Raymond: *See—*
Gordon, David A.; and Seltzer, Raymond, 3,946,011.
Semenov, Pavel Vladimirovich: *See—*
Milman, Boris Samoilovich; Mirzoian, Genrikh Sergeevich; Strizhov, Gennady Sergeevich; Tinyakov, Viktor Gurievich; Doroschenko, Pavel Petrovich; Karssky, Vladimir Evgenievich; Levin, Moisei Markovich; Krapukhin, Viktor Mikhailovich; and Semenov, Pavel Vladimirovich, 3,945,427.
Semi-Alloys Incorporated: *See—*
Hascoe, Norman, 3,946,190.
Semiconductor Research Foundation: *See—*
Nishizawa, Jun-ichi; Sasaki, Ichiemon; Ishida, Katsuhiko; Tauchi, Syoji; Nishimura, Takeshi; Seki, Takeo; and Kozuma, Noboru, 3,946,270.
Semperit AG: *See—*
Gorter, Werner; Kresta, Erich; and Stumpf, Horst, 3,945,420.
Senger, Gerhard Franz-Josef: *See—*
Poque, Dionysius Josef; Senger, Gerhard Franz-Josef; and Vogler, Hans Jurgen, 3,945,421.
Senoo, Tadao: *See—*
Takahashi, Mitsuhiro; and Senoo, Tadao, 3,946,097.
Sergeenkov, Sergei Ivanovich: *See—*
Ulyanov, Lev Petrovich; Borisenkov, Oleg Nikolaevich; Kastorskaya, Natalya Nikolaevna; Vinogradov, Georgy Vladimirovich; Yanovsky, Jury Grigorievich; and Sergeenkov, Sergei Ivanovich, 3,945,242.
Serritella, Daniel J. Vehicle warning system. 3,946,360, Cl. 340-61.000.
Serta, Inc.: *See—*
Simon, LeRoy J., 3,945,627.
Servais, Ronald A.; Bauer, Paul T.; and Meckstroth, Alan F., to Aerospan Corporation. Streamlining apparatus for articulated road vehicle. 3,945,677, Cl. 296-1.00S.
Sessler, Gerhard Martin: *See—*
Schonhorn, Harold; Sessler, Gerhard Martin; and West, James Edward, 3,945,112.
Setzer, William C.: *See—*
Winter, Joseph; Pryor, Michael J.; and Setzer, William C., 3,945,860.
Severov, Genrikh Fedorovich: *See—*
Kaminsky, Igor Vasilievich; Pimenov, Viktor Alexeevich; and Severov, Genrikh Fedorovich, 3,945,578.
Shaffer, Edward C.: *See—*
Torp, Bruce A.; and Shaffer, Edward C., 3,945,935.
Shaken Co., Ltd.: *See—*
Ishii, Kiyoshi; Fuse, Shigeru; and Takashima, Masatake, 3,946,407.
Shang, Jer-Yu; and Wynkoop, Raymond, to Sun Ventures, Inc. Ammoxidation apparatus. 3,945,804, Cl. 23-288.00E.
Sharp Kabushiki Kaisha: *See—*
Inazaki, Kenzoo; Kanatani, Yoshiharu; Ise, Masahiro; Mizukami, Etsuo; and Suzuki, Chuji, 3,946,371.
Sharps Associates: *See—*
Winn, Martin; Razdan, Raj Kumar; Dalzell, Haldean Cloyce; and Krei, Joyce Ruth, 3,946,111.
Shatas, Romas A.: *See—*
Roberts, Thomas G.; Shatas, Romas A.; Meyer, Harry C., III; and Stettler, John D., 3,946,236.
Roberts, Thomas G.; Shatas, Romas A.; Meyer, Harry C., III; and Stettler, John D., 3,946,240.
Shatterproof Glass Corporation: *See—*
McKelvey, Harold E., 3,945,911.
Svendor, John S.; and Shintock, Eugene, 3,945,903.
Shavel, John, Jr.: *See—*
Brown, Richard E.; and Shavel, John, Jr., 3,946,008.
Shearer, Janet. Disposable bib and method for making the same. 3,945,048, Cl. 2-49.00R.
Sheesley, Wilmer Lee; and Pauza, William Vito, to AMP Incorporated. Lead frame adapted for electrical switch package. 3,945,808, Cl. 29-193.500.
Shell Oil Company: *See—*
Anderson, Martin; and Kirkham, Peter H., 3,945,998.
Chiu, Ying-Chech; and Hill, Harold J., 3,945,437.
Closmann, Philip J.; Drinkard, Gary; Street, Evan H.; Templeton, Charles C.; and Tham, Min Jack, 3,945,679.
Harrison, Tony; and Weatherhead, Roger G., 3,945,971.
Shemano, Irving, to Richardson-Merrell Inc. Pharmaceutically useful bis-basic ester and thioester derivatives. 3,946,112, Cl. 424-308.000.
Sherman, Caryl M., to Harshaw Chemical Company, The. Method of encapsulating particles and the resultant product. 3,946,134, Cl. 428-403.000.
Sherman, Earle C.: *See—*
Harrelson, Glen R.; and Sherman, Earle C., 3,945,560.
Shiba, Keisuke; Hinata, Masanao; Ohi, Reiichi; and Shishido, Tadao, to Fuji Photo Film Co., Ltd. Fogged, direct-positive silver halide emulsion containing desensitizers and a dimethine optical sensitizing dye. 3,945,832, Cl. 96-100.000.
Shibata, Masao: *See—*
Matsumoto, Fukuo; Kondo, Kikuo; and Shibata, Masao, 3,945,222.
Shibata, Tadashi: *See—*
Miura, Masaki; Ichiryu, Ken; Shigeta, Masayuki; and Shibata, Tadashi, 3,945,468.
Shigeno, Shunichi: *See—*
Fujisaki, Yoshinori; and Shigeno, Shunichi, 3,945,103.
Shigeta, Masayuki: *See—*
Miura, Masaki; Ichiryu, Ken; Shigeta, Masayuki; and Shibata, Tadashi, 3,945,468.
Shimada, Satoshi, to Sony Corporation. Color television camera with luminance non-uniformity compensation. 3,946,434, Cl. 358-44.000.
Shimago, Kozo: *See—*
Yamada, Hirotada; Tobiki, Hisao; Nakatsuka, Iwao; Tanno, Norihiko; Shimago, Kozo; and Nakagome, Takenari, 3,945,995.
Shimizu, Kazuaki, to Nissan Motor Company Limited. Disc brake pad wear indicator structure. 3,945,471, Cl. 188-1.00A.

Shimizu, Shigemi: *See—*
Toyoda, Hiroshi; Shimizu, Shigemi; Terauchi, Kiyoshi; and Hiraga, Masaharu, 3,945,765.

Shimizu, Toshihide: *See—*
Koyanagi, Shunichi; Kitamura, Hajime; and Shimizu, Toshihide, 3,945,958.

Shimizuhata, Shitiro: *See—*
Takamizawa, Koji; Shimizuhata, Shitiro; Shinonaga, Akinori; and Tsuruta, Masaru, 3,946,181.

Shimo, Shoji: *See—*
Atago, Takeshi; Hosho, Yukio; and Shimo, Shoji, 3,945,205.

Shimoishizaka, Masashi: *See—*
Tobita, Susumu; Shimoishizaka, Masashi; Sumita, Yuzo; Oishi, Isamu; and Kato, Koji, 3,945,552.

Shimokawa, Masaaki: *See—*
Imai, Satoshi; Eguchi, Tamiyuki; and Shimokawa, Masaaki, 3,945,927.

Shimomukai, Hiroshi: *See—*
Kimbara, Motoyasu; and Shimomukai, Hiroshi, 3,945,351.

Shimomura, Hiromi: *See—*
Matsui, Masanao; Katsube, Junki; Shimomura, Hiromi; and Murayama, Eichi, 3,946,065.

Shimp, Alan B.: *See—*
Paice, Derek A.; and Shimp, Alan B., 3,946,279.

Shinetsu Chemical Company: *See—*
Koyanagi, Shunichi; Kitamura, Hajime; and Shimizu, Toshihide, 3,945,958.

Shinonaga, Akinori: *See—*
Takamizawa, Koji; Shimizuhata, Shitiro; Shinonaga, Akinori; and Tsuruta, Masaru, 3,946,181.

Shintock, Eugene: *See—*
Svendor, John S.; and Shintock, Eugene, 3,945,903.

Shiohara, Katsuaki: *See—*
Yatsunami, Kazuharu; Miyakado, Satoru; Shiohara, Katsuaki; and Honda, Akira, 3,945,817.

Shirai, Shinji: *See—*
Nikaido, Norio; Shirai, Shinji; Iihashi, Mototaka; and Umemoto, Sueo, 3,945,899.

Shishido, Tadao: *See—*
Shiba, Keisuke; Hinata, Masanao; Ohi, Reiichi; and Shishido, Tadao, 3,945,832.

Shoh, Andrew, to Branson Ultrasonics Corporation. Sonic apparatus. 3,945,618, Cl. 259-114.000.

Shoji, Senji; Yasunari, Kenjiro; and Kosa, Yasunobu, to Hitachi, Ltd. Multi-emitter transistor having heavily doped N+ regions surrounding base region of transistors. 3,946,425, Cl. 357-64.000.

Shterev, Mihail Georgiev: *See—*
Chitakyan, Onik Kevork; and Shterev, Mihail Georgiev, 3,946,333.

Shupe, Russell D.; Maddox, Jim, Jr.; and Tate, Jack F., to Texaco Inc. Method for oil recovery. 3,945,439, Cl. 166-308.000.

Shupe, Russell D.: *See—*
Tate, Jack F.; Maddox, Jim, Jr.; and Shupe, Russell D., 3,945,438.

Sicka, Richard W.: *See—*
Vicic, John C.; and Sicka, Richard W., 3,945,966.

Siden, Dennis Carl; and McMills, Corey John, to Raychem Corporation. Method for the simultaneous termination in terminal sleeves of a plurality of wires with a multi-pin connector. 3,945,114, Cl. 29-628.000.

Siegel, Howard M.: *See—*
Lee, Leonard S.; Siegel, Howard M.; and Sopp, Samuel W., 3,945,862.

Siemens Aktiengesellschaft: *See—*
Biermann, Rudolf, 3,946,228.
Habock, Adolf; Beckmann, Oskar; Frese, Stefan; Radda, Herbert; Mayerhofer, Franz; and Leowald, Karl-Friedrich, 3,946,389.
Schmidt, Fritz, 3,946,141.
Stehle, Heinz; Assmann, Helmut; Wahode, Peter; and Janson, Walter, 3,945,245.
Steiner, Ewald; and Scholtholt, Hans, 3,945,706.

Sigma Diesel: *See—*
Vuaille, Andre, 3,945,773.

Signode Corporation: *See—*
Wuetig, Ralph T., 3,945,479.

Sigsbee, Raymond A.; and Barber, William D., to General Electric Company. Resistive gate field effect transistor. 3,946,418, Cl. 357-23.000.

Silonics, Inc.: *See—*
Kyser, Edmond L.; and Sears, Stephan B., 3,946,398.

Silver Industries, Inc.: *See—*
Silver, Jules, 3,945,381.

Silver, Jules, to Silver Industries, Inc. Eye drop dispenser and cup. 3,945,381, Cl. 128-249.000.

Silvey, E. Ray. Universal saw chain grinding machine. 3,945,271, Cl. 76-25.00A.

Simecek, Tomislav; and Sipek, Emil, to Ceskoslovenska Akademie Ved. Arrangement for measuring, checking and control of the position of chosen points of objects with respect to an optical aiming line. 3,945,730, Cl. 356-167.000.

Simjian, Luther G. Exercise and massaging apparatus. 3,945,637, Cl. 272-73.000.

Simmons Fastener Corporation: *See—*
Schlueter, Ernest, 3,945,595.

Simnad, Massoud T.: *See—*
Ragone, David V.; and Simnad, Massoud T., 3,945,629.

Simon, Joseph William, to Electromagnetic Sciences, Inc. Phase shifter. 3,946,340, Cl. 333-24.100.

Simon, LeRoy J., to Serta, Inc. Box spring assembly using modular coil springs. 3,945,627, Cl. 267-108.000.

Simons, Leon, to NL Industries Inc. Thread-rolling method, thread-rolling dies, and method of manufacturing the dies. 3,945,272, Cl. 76-107.00R.

Simonsen, Harald; and Brautigam, Jurgen, to Continental Gummi-Werke Aktiengesellschaft. Connection for the ends of strength carriers in conveyor belts. 3,945,263, Cl. 74-231.00J.

Simpson, Ronnie C. Method and clip for installation of insulation. 3,945,158, Cl. 52-22.000.

Sinclair, Donald J., to International Harvester Company. Cam operated reel lock and adjustment. 3,945,180, Cl. 56-221.000.

Sipek, Emil: *See—*
Simecek, Tomislav; and Sipek, Emil, 3,945,730.

Sitabkhan, Abdul N., to HTL Industries, Inc. Magnetic pressure indicator for a container. 3,946,175, Cl. 200-83.00L.

Skerlos, Peter Constantine, to Zenith Radio Corporation. Television receiver operable in exact or extended range tuning modes. 3,946,148, Cl. 178-5.8AF.

Skoli, Sigmund P.; Witt, Chester J.; and Jones, Hartl R., to Mojonnier Bros. Co. System for mixing various kinds of fluids for producing beverages, and means for cleaning the apparatus between operations. 3,945,411, Cl. 141-91.000.

Skrabek, Emanuel Andrew; and Trimmer, Donald Smith, to Teledyne, Inc. Thermoelectric device including an alloy of GeTe and AgSbTe as the P-type element. 3,945,855, Cl. 136-238.000.

Slakey, Philip B., to Industrial Clean Air, Inc. Reverse-air manifold and flow passage module. 3,945,400, Cl. 137-608.000.

Sleeper & Hartley Corporation: *See—*
Russell, Frank S., 3,945,239.

Smallegan, Jon, to Novo Products, Inc. Temperature control system. 3,945,564, Cl. 236-46.00E.

Smith, Alfred A. Foldable walker. 3,945,389, Cl. 135-45.00A.

Smith, Dale D.: *See—*
Sullivan, James Patrick; and Smith, Dale D., 3,945,140.

Smith, David Theo: *See—*
Cruttwell, Ian Andrew; and Smith, David Theo, 3,946,361.

Smith, Harry A.; and Bozzi, Edward G., Jr., to Dow Chemical Company, The. N,N'-Diglycidyl-N,N'-dialkyl aryl disulfonamides. 3,945,973, Cl. 260-49.000.

Smith, Harry D.: *See—*
Kennedy, Thomas W., Jr.; and Smith, Harry D., 3,945,590.

Smith, Harry Davis, Jr., to Texaco Inc. Well logging method and apparatus. 3,946,226, Cl. 250-256.000.

Smith, Lawrence S.: *See—*
Bradley, Floyd P.; and Smith, Lawrence S., 3,945,199.

Smith, Lewis R., to Analog Devices, Incorporated. Isolation amplifier. 3,946,324, Cl. 330-10.000.

Smith, Raymond Marshall: *See—*
Elsbery, James W.; and Smith, Raymond Marshall, 3,945,077.

Smith, Roger W. Portable radial arm saw. 3,945,286, Cl. 83-486.100.

Smith, Valor C.; Gantsweg, Marvin; and Faigen, Ivan M., to Magnavox Company, The. Antenna for providing a dielectrically induced, directionally dependent radiation pattern phase shift. 3,946,396, Cl. 343-753.000.

SmithKline Corporation: *See—*
Bennett, Russell B.; Millicovsky, William; and Pritz, Howard B., 3,945,383.
Berges, David Alan, 3,946,005.
Pritz, Howard B.; and Talbert, Sherwood G., 3,945,379.

Snavely, Kenneth E., to Phillips Petroleum Company. Hard rubber compositions with high extender oil levels. 3,945,977, Cl. 260-33.6AQ.

Snow Brand Milk Products Co., Ltd.: *See—*
Suzuki, Masahiko; Motomura, Takayuki; Seko, Kiyoshi; and Takahashi, Hiroshi, 3,945,614.

Sobolev, Valerian Mikhailovich: *See—*
Gershanov, Felix Borisovich; Liakumovich, Alexandr Grigorievich; Michurov, Jury Ivanovich; Pantukh, Boris Izrailevich; Rutman, Grigory Iosifovich; Sobolev, Valerian Mikhailovich; Grinberg, Alexandr Afroimovich; Gurvich, Yakov Abramovich; Zakharova, Nina Vasilievna; and Nafikova, Almira Mudarisovna, 3,946,086.

Societa Italiana Resine S.I.R. S.p.A.: *See—*
Calcagno, Benedetto; Divo, Claudio; and Ghirga, Marcello, 3,946,068.

Societe Anonyme dite: Antar Petroles de l'Atlantique: *See—*
Ouvrard, Paul, 3,945,243.

Societe Anonyme dite: Ateliers et Chantiers de Bretagne-A C B: *See—*
Colin, Jean-Paul, 3,945,508.

Societe Anonyme dite: Cartonneries de la Lys "ONDULYS": *See—*
Strebelle, Georges, 3,945,561.

S.A. Martin: *See—*
Barny, Jean-Jacques, 3,945,305

Societe Anonyme: Poclain: *See—*
Bourges, Bernard M., 3,945,300.

Societe Anonyme Usines Emile Henricot: *See—*
Henricot, Paul E., 3,945,327.

Societe des Procedes l'Air Liquide et Technip de Liquefaction des Gaz Naturels: *See—*
Darredeau, Bernard; Cappiello, Pierre; and Le Bihan, Herve, 3,945,214.

Societe d'Etudes de Machines Thermiques: *See—*
Kuhn, Karl Walter, 3,945,356.

Societe Lignes Telegraphiques et Telephoniques: *See—*
Chiron, Bernard; Puyhaubert, Jean; and Seguin, Michel, 3,946,341.
Societe Nouvelle de la Teinturerie de la Chaussee Romaine: *See—*
Bacro, Bruno, 3,945,545.
Sokolow, Nickolas N., to Beloit Corporation. Cascade type dynamic mixer for extrusion of plastic. 3,945,622, Cl. 259-191.000.
Solberg, Bjorn Ragnar, to International Standard Electric Corporation. Pulse train generator. 3,946,253, Cl. 307-261.000.
Solie, James C.; Doss, Daniel L.; and Waldrop, Jerald Lee, to Owatonna Tool Company. Timber felling device. 3,945,610, Cl. 254-93.00R.
Solomon, Herman J.: *See—*
Leder, Frederic; Kramer, George M.; and Solomon, Herman J., 3,946,088.
Solovei, Alexei Ivanovich: *See—*
Borisov, Vasily Nikolaevich; Akulov, Evgeny Alexandrovich; and Solovei, Alexei Ivanovich, 3,945,312.
Solvay & Cie: *See—*
De Ceuster, Jean; and Grassi, Bruno, 3,945,910.
Giacopelli, Umberto, 3,945,909.
Somerville, John G.; and Vasicek, David J. Anchoring means for earth tunneling devices. 3,945,608, Cl. 254-29.00R.
Sommer, Richard; and Wolfrum, Gerhard, to Bayer Aktiengesellschaft. Arylsulphonylaminosulphonylphenyl-azo-arylene-azo-phenyl dyestuff. 3,945,992, Cl. 260-174.000.
Sony Corporation: *See—*
Nagami, Masaru; and Niino, Osami, 3,946,249.
Saito, Tsunenari; and Aoki, Yoshio, 3,946,266.
Shimada, Satoshi, 3,946,434.
Takashino, Shizuo, 3,946,436.
Yagi, Hajime; Saito, Yoshihiro; and Hirano, Koji, 3,946,422.
Sopp, Samuel W.: *See—*
Lee, Leonard S.; Siegel, Howard M.; and Sopp, Samuel W., 3,945,862.
Sorensen, Ejnar. Method for removing waste disposers. 3,945,276, Cl. 82-47.000.
Sossong, Henry J., to Thiokol Corporation. Method and apparatus for expelling fluids. 3,945,539, Cl. 222-386.500.
Soth, Henry J.: *See—*
Whiting, Roy M.; Soth, Henry J.; and Ragard, Phillip A., 3,945,100.
Spanoudis, Louis, to Owens-Illinois, Inc. Laser assemblies using glass discs with lead borate coatings. 3,946,128, Cl. 428-66.000.
Spates, Charles D.: *See—*
Cook, Virgil W.; Spates, Charles D.; Heil, Charles Wayne, deceased; Heil, Terry W., executor; and Diers, executrix by Kay A., 3,945,081.
Speaker Motion Systems, Inc.: *See—*
Speaker, Richard L., 3,945,485.
Speaker, Richard L., to Speaker Motion Systems, Inc. Tray conveying apparatus. 3,945,485, Cl. 198-155.000.
Speakman, Eugene R., to McDonnell Douglas Corporation. Fatigue bushing assembly. 3,945,695, Cl. 308-240.000.
Speidel, Thomas O. P., to Lodding Engineering Corporation. Fourdrinier steam shower. 3,945,881, Cl. 162-208.000.
Spence, Thomas William Matches: *See—*
Davison, Michael; Frankham, David Binfield; and Spence, Thomas William Matches, 3,946,002.
Spencer, Phillip G. Sighting apparatus. 3,945,127, Cl. 33-265.000.
Sperry, Charles R., to Instapak Corporation. Foam dispensing apparatus. 3,945,569, Cl. 239-112.000.
Sperry Rand Corporation: *See—*
Daniels, John F.; Melito, Maurice A., Jr.; and Szymansky, Edward, 3,945,115.
Kennedy, Thomas W., Jr.; and Smith, Harry D., 3,945,590.
Lustig, Claude D.; and Thaxter, James B., 3,946,267.
Olsen, James A.; and Butler, Lee D., 3,945,507.
Tolmie, Robert J., 3,945,118.
Spier, I. Martin; and Arbib, Richard H., to Level-Line Products. Picture hook. 3,945,599, Cl. 248-476.000.
Spindel-,Motoren- Und Maschinenfabrik A.G.: *See—*
Widmer, Dieter, 3,945,187.
Spindler & Hoyer KG Werk fur Feinmechanik und Optik: *See—*
Mallwitz, Detlef; Klingner, Hartmut; and Kubbetat, Wolfgang, 3,945,600.
Spoerke, Roger W., to Goodyear Tire & Rubber Company, The. Preparation of methacrylamides. 3,945,970, Cl. 260-47.0UA.
Sprenkle, George J.: *See—*
Braun, Robert E.; Jones, Richard H.; Sprenkle, George J.; and Stopper, Herbert, 3,946,276.
Sprinter System of America, Ltd.: *See—*
Stannard, Charles G., 3,945,108.
Square D Company: *See—*
Oster, Clark L.; and Tharp, James A., 3,946,346.
Stahle, Eugen; and Frauhammer, Karl, to Robert Bosch GmbH. Vibration generator. 3,945,259, Cl. 74-61.000.
Staiger, Karl: *See—*
Streit, Klaus; and Staiger, Karl, 3,946,303.
Stamicarbon, N.V.: *See—*
Paasen, Mathijs M. F.; and Meijerink, Harrie H. J., 3,946,076.
Standard Oil Company: *See—*
McCurdy, John L.; and Stein, Norman, 3,945,976.
Stanford Research Institute: *See—*
Crowe, David F.; Peters, Richard H.; Tanabe, Masato; and Detre, George, 3,946,052.
Pierce, Edward T., 3,945,251.
Rosen, Charles A., 3,945,729.
Stannard, Charles G., to Sprinter System of America, Ltd. Core inserter for filters. 3,945,108, Cl. 29-450.000.
Star-Kist Foods, Inc.: *See—*
Hanna, Keith L., 3,946,123.
State of Israel Ministry of Agriculture, The: *See—*
Leavitt, Chaim; Alper, Yekutiel; and Gruenewald, Tzvi, 3,945,330.
State of Israel Ministry of Defence Hakirya, The: *See—*
Popper, Jakhin Boas; and Lowy, Avigdor, 3,945,324.
Statham Instruments, Inc.: *See—*
Elazar, Shmuel; and Bierbaum, Charles A., 3,945,250.
Stauffer Chemical Company: *See—*
Feiler, Leonard; and Gelman, Sheldon F., 3,945,985.
STECE - AB Industrifjadrar: *See—*
Farlind, Stig Axel Goran, 3,945,091.
Steele, Steven Gary: *See—*
Castrodale, Daniel Owen; Steele, Steven Gary; Wentink, William Stewart; and Wheeler, Stephen Edward, 3,946,439.
Steffen, Klaus-Dieter: *See—*
Janssen, Paul; and Steffen, Klaus-Dieter, 3,946,059.
Stehle, Heinz; Assmann, Helmut; Wahode, Peter; and Janson, Walter, to Siemens Aktiengesellschaft. Method and equipment for detecting deflective nuclear fuel rods. 3,945,245, Cl. 73-71.400.
Steiger, Anton, to Sulzer Brothers Ltd. Hydrostatic piston machine. 3,945,303, Cl. 92-58.000.
Stein, Jeffrey P., to Honeywell Inc. Signal generator. 3,946,255, Cl. 307-269.000.
Stein, Norman: *See—*
McCurdy, John L.; and Stein, Norman, 3,945,976.
Steinbock, Rolf. Tandem rolling mill arrangement. 3,945,234, Cl. 72-235.000.
Steiner, Ewald; and Scholtholt, Hans, to Siemens Aktiengesellschaft. Distribution frame for communication facilities. 3,945,706, Cl. 339-113.00L.
Steinke, Frederick H.: *See—*
Brever, Leslie H.; and Steinke, Frederick H., 3,946,115.
Stengel, Edgar: *See—*
Reinke, Friedhelm; Stengel, Edgar; Emde, Friedhelm; and Schwarz, Hans Rudolf, 3,945,483.
Stengritt, Wolf Dietrich: *See—*
Zodrow, Bernhard; Kovacev, Milan; Stengritt, Wolf Dietrich; and Hopp, Rudolf, 3,945,466.
Stenne, Pierre, to Claudel S.A. Apparatus for the continuous production of curds. 3,945,310, Cl. 99-452.000.
Stephanoff, Nicholas N., to Fluid Energy Processing & Equipment Co. Expanded chamber centrifugal drying mill. 3,945,130, Cl. 34-10.000.
Stepp, Gregory; and Patrick, Michael Dennis, Sr., to Grimes Manufacturing Company. SCR strobe lamp control for preventing capacitor recharge during after-glow. 3,946,271, Cl. 315-241.00S.
Sterling Drug Inc.: *See—*
Eggensperger, Heinz; and Diehl, Karl-Heinz, 3,946,006.
Stettler, John D.: *See—*
Roberts, Thomas G.; Shatas, Romas A.; Meyer, Harry C., III; and Stettler, John D., 3,946,236.
Roberts, Thomas G.; Shatas, Romas A.; Meyer, Harry C., III; and Stettler, John D., 3,946,240.
Stewart-Warner Corporation: *See—*
Baker, John D.; and Carus, Bryce W., 3,946,311.
Stimpson, Donald E., to Chrysler Corporation. Adjustable connector. 3,945,267, Cl. 74-501.00R.
Stoepel, Kurt: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,946,026.
Stokes, Peter Bryan: *See—*
Burgess, Brian; Bayliss, Raymond Terence; Stokes, Peter Bryan; and Eynon, George Thomas, 3,945,573.
Stoll, Harold M.: *See—*
Hunsperger, Robert G.; Stoll, Harold M.; Tangonan, Gregory L.; and Yariv, Amnon, 3,945,110.
Stopper, Herbert: *See—*
Braun, Robert E.; Jones, Richard H.; Sprenkle, George J.; and Stopper, Herbert, 3,946,276.
Stossel, Ernest. Carbamide adducts of polymetalophosphamate. 3,945,987, Cl. 260-96.50C.
Stotz & Co.: *See—*
Koula, Zdenek, 3,945,433.
Strack, Donald Robert, to Protective Treatments, Inc. Sealing adhesive strands and compositions therefor. 3,945,975, Cl. 260-33.6AQ.
Straub, Hermann, to Sulzer Brothers Ltd. Arrangement for mounting tubes in a tank wall. 3,945,431, Cl. 165-11.000.
Strauff, Gunther, to Langen & Co. Servo steering systems for motor vehicles. 3,945,456, Cl. 180-79.20R.
Strauss, Gottfried; and Klotzbach, Kurt. Apparatus for making relief cuts on previously scored glass sheets. 3,945,278, Cl. 83-12.000.
Strebelle, Georges, to Societe Anonyme dite: Cartonneries de la Lys "ONDULYS". Cardboard carton. 3,945,561, Cl. 229-41.00B.
Street, Evan H.: *See—*
Closmann, Philip J.; Drinkard, Gary; Street, Evan H.; Templeton, Charles C.; and Tham, Min Jack, 3,945,679.
Streit, Klaus; and Staiger, Karl, to Robert Bosch GmbH. Monolithic integrated voltage regulator. 3,946,303, Cl. 323-22.00T.
Strick Corporation: *See—*
Abolins, Andrew; and Bertsch, Joseph A., 3,945,687.

Strizhov, Gennady Sergeevich: *See—*
Milman, Boris Samoilovich; Mirzoian, Genrikh Sergeevich; Strizhov, Gennady Sergeevich; Tinyakov, Viktor Gurievich; Doroschenko, Pavel Petrovich; Karnsky, Vladimir Evgenievich; Levin, Moisei Markovich; Krapukhin, Viktor Mikhailovich; and Semenov, Pavel Vladimirovich, 3,945,427.

Stromgren, Lawrence Thompson. Flexible knee support. 3,945,046, Cl. 2-22.000.

Stroup, James P., to Latrobe Steel Company. Bearing having extended rolling fatigue life. 3,945,821, Cl. 75-126.00C.

Stuart, Richard L.; and Bhopale, Arvind M., to Rixon, Incorporated. Multi-level digital filter. 3,946,214, Cl. 235-152.000.

Stumpf, Horst: *See—*
Gorter, Werner; Kresta, Erich; and Stumpf, Horst, 3,945,420.

Subbuteo Sports Games Limited: *See—*
Denmark, James, 3,945,640.

Subsea Equipment Associates Ltd.: *See—*
Forbes, Gordon B.; and Van Houten, Roland W., 3,945,213.

Suchy, Milos: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,946,040.

Sugiyama, Keiichi: *See—*
Sugiyama, Noboru; Suzuki, Masamichi; Watanabe, Katami; Sugiyama, Keiichi; Tadenuma, Hachiro; Kato, Takashi; Kaneda, Ryoji; and Yoshino, Makoto, 3,945,930.

Sugiyama, Noboru; Suzuki, Masamichi; Watanabe, Katami; Sugiyama, Keiichi; Tadenuma, Hachiro; Kato, Takashi; Kaneda, Ryoji; and Yoshino, Makoto, to Toho Chemical Industry Co., Ltd.; and Nippon Light Metal Research Laboratory, Ltd. Water-soluble metal working lubricants. 3,945,930, Cl. 252-32.500.

Sugiyama, Tadao: *See—*
Matsubara, Hiroyoshi; Osuka, Tatsumi; and Sugiyama, Tadao, 3,945,858.

Suizu, Dairi; and Kato, Yasuaki, to Okura Yusoki Kabushiki Kaisha. Apparatus for loading goods. 3,945,522, Cl. 214-512.000.

Sullivan, Arthur Francis; Brockett, Frank Howard, III; and Harthan, Lewis John, III, to International Nickel Company, Inc., The. Pressure-responsive valve. 3,945,394, Cl. 137-430.000.

Sullivan, James Patrick; and Smith, Dale D. Card book. 3,945,140, Cl. 40-102.000.

Sullivan, William A., Jr.; and Eichorn, Roger H., deceased (by Rochester, Lincoln First Bank of, executor), to Xerox Corporation. Copy method utilizing single radiant ray path for imaging and transfixing. 3,946,230, Cl. 250-316.000.

Sulzer Brothers Ltd.: *See—*
Steiger, Anton, 3,945,303.
Straub, Hermann, 3,945,431.

Sumida, Shizuo; Nii, Kazuo; Ito, Hisatsugu; Ueda, Atsushi; and Ishii, Mitsuaki, to Mitsubishi Denki Kabushiki Kaisha; and Toyo Kogyo Co., Ltd. Time division multiple transmission control apparatus. 3,946,362, Cl. 340-147.0SY.

Sumita, Masujiro; Konno, Ryozo; and Takeuchi, Toru, to Toyo Ink Manufacturing Company, Ltd. Photosensitive coating composition. 3,945,833, Cl. 96-115.00R.

Sumita, Yuzo: *See—*
Tobita, Susumu; Shimoishizaka, Masashi; Sumita, Yuzo; Oishi, Isamu; and Kato, Koji, 3,945,552.

Sumitomo Chemical Company, Limited: *See—*
Ikeda, Takuo; Hadano, Takushige; and Nogi, Syunsuke, 3,945,990.
Matsui, Masanao; Katsube, Junki; Shimomura, Hiromi; and Murayama, Eichi, 3,946,065.
Yamada, Hirotada; Tobiki, Hisao; Nakatsuka, Iwao; Tanno, Norithiko; Shimago, Kozo; and Nakagome, Takenari, 3,945,995.

Sun Ventures, Inc.: *See—*
Shang, Jer-Yu; and Wynkoop, Raymond, 3,945,804.

Sundstrand Data Control, Inc.: *See—*
Bateman, Charles Donald, 3,946,358.

Sung, Thomas. Circular toothbrush. 3,945,076, Cl. 15-21.00R.

Sunkist Growers, Inc.: *See—*
Paddock, Paul F.; and Cramer, Jerry W., 3,945,489.

Superior Oil Company, The: *See—*
Weinstein, David Harold; Ashworth, Monroe Alfred, III; and Mallett, A. J., 3,946,357.

Surgical Design Corporation: *See—*
Banko, Anton, 3,945,375.

Sutton, Stephen John. Air reefing system. 3,945,592, Cl. 244-152.000.

Suzuki, Chuji: *See—*
Inazaki, Kenzoo; Kanatani, Yoshiharu; Ise, Masahiro; Mizukami, Etsuo; and Suzuki, Chuji, 3,946,371.

Suzuki, Isao: *See—*
Masuda, Naosuke; Yanagawa, Itiro; and Suzuki, Isao, 3,945,690.

Suzuki, Kunihiko; and Kurisu, Katsuyasu, to Nissan Motor Company Limited. Interlocking device for manual change speed gear. 3,945,458, Cl. 180-82.00C.

Suzuki, Masahiko; Motomura, Takayuki; Seko, Kiyoshi; and Takahashi, Hiroshi, to Snow Brand Milk Products Co., Ltd.; Fuji Machinery Co., Ltd.; and Sanwa Machine Co., Inc. Ice cream freezer. 3,945,614, Cl. 259-4.00R.

Suzuki, Masamichi: *See—*
Sugiyama, Noboru; Suzuki, Masamichi; Watanabe, Katami; Sugiyama, Keiichi; Tadenuma, Hachiro; Kato, Takashi; Kaneda, Ryoji; and Yoshino, Makoto, 3,945,930.

Suzuki Motor Company, Ltd.: *See—*
Hosoda, Kiyoshi; Yamauchi, Teruo; and Kobayashi, Masaru, 3,945,166.
Ishimori, Shigeru; and Otsuka, Shinjiro, 3,945,893.

Suzuki, Naoyuki: *See—*
Ueda, Harutoshi; Suzuki, Naoyuki; and Nagao, Masami, 3,945,840.

Svahn, Carl Magnus: *See—*
Vessman, Jorgen; Svahn, Carl Magnus; and Hartvig, Per, 3,946,063.

Svendor, John S.; and Shintock, Eugene, to Shatterproof Glass Corporation. Sputter-coating of glass sheets or other substrates. 3,945,903, Cl. 204-192.000.

Svenska Rotor Maskiner Aktiebolag: *See—*
Schibbye, Hjalmar, 3,945,216.

Swanberg, Melvin E., to Xerox Corporation. Automatic focus with variable magnification. 3,946,222, Cl. 250-201.000.

Swanson, Capleton I.: *See—*
Holland, William P.; Swanson, Capleton I.; and Randmer, Jacob A., 3,946,261.

Swanson, Carl D.: *See—*
Berry, James M.; Hauser, Anthony J.; and Swanson, Carl D., 3,946,405.

Swanson, William C.: *See—*
Barkstrom, Reynold; Rickerd, Calvin P.; and Swanson, William C., 3,945,175.

Sweetman, Dorothy M. Safety arch. 3,945,337, Cl. 116-36.000.

SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH: *See—*
Eberle, Dieter; Hanselmann, Dieter; and Prohaska, Hans, 3,946,178.

Swiss Aluminium Limited: *See—*
Winter, Joseph; Pryor, Michael J.; and Setzer, William C., 3,945,860.
Zehnder, Jurg, 3,945,325.

Sydney S. Bird and Sons Limited: *See—*
Wilkinson, Alfred, 3,946,344.

Syntex Inc.: *See—*
Beard, Colin C., 3,946,031.

Szymansky, Edward: *See—*
Daniels, John F.; Melito, Maurice A., Jr.; and Szymansky, Edward, 3,945,115.

Tadenuma, Hachiro: *See—*
Sugiyama, Noboru; Suzuki, Masamichi; Watanabe, Katami; Sugiyama, Keiichi; Tadenuma, Hachiro; Kato, Takashi; Kaneda, Ryoji; and Yoshino, Makoto, 3,945,930.

Taguchi, Tatsuya, to Canon Kabushiki Kaisha. Shutter release device in camera. 3,946,408, Cl. 354-51.000.

Taibi, Frank P. Mobile continuous concrete proportioning plant. 3,945,619, Cl. 259-154.000.

Takahashi, Hiroshi: *See—*
Suzuki, Masahiko; Motomura, Takayuki; Seko, Kiyoshi; and Takahashi, Hiroshi, 3,945,614.

Takahashi, Mitsuhiro; and Senoo, Tadao, to Ube-Nitto Kasei Co., Ltd. Process for forming continuous fiber reinforced material embedded in thermosetting resin. 3,946,097, Cl. 264-90.000.

Takahashi, Nobuaki, to Victor Company of Japan, Ltd. Voltage controlled oscillator circuit. 3,946,330, Cl. 331-8.000.

Takahashi, Nobuyuki: *See—*
Murano, Minoru; Yanabu, Satoru; Tamagawa, Toru; Takahashi, Nobuyuki; Okumura, Hiroyuki; and Ohhashi, Hiroshi, 3,946,179.

Takahashi, Shinji: *See—*
Ueki, Atsufumi; Nishida, Nobuo; and Takahashi, Shinji, 3,946,430.

Takahashi, Takeshi; Kawahara, Kenji; Takahashi, Toshiyuki; Kato, Koichi; and Yamazaki, Yoshio, to Takeda Chemical Industries, Ltd. Method for the production of cephalosporins. 3,945,888, Cl. 195-29.000.

Takahashi, Toru: *See—*
Ito, Yoshio; Takahashi, Toru; Ishihara, Takayuki; Kobayashi, Hiroo; and Matsuoka, Atsushi, 3,945,726.

Takahashi, Toshiyuki: *See—*
Takahashi, Takeshi; Kawahara, Kenji; Takahashi, Toshiyuki; Kato, Koichi; and Yamazaki, Yoshio, 3,945,888.

Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha. Method of manufacturing slide fastener stringers having coupling elements woven into a fabric tape. 3,945,405, Cl. 139-22.000.

Takamizawa, Koji; Shimizuhata, Shitiro; Shinonaga, Akinori; and Tsuruta, Masaru. Push button-type switch. 3,946,181, Cl. 200-159.00R.

Takashima, Masatake: *See—*
Ishii, Kiyoshi; Fuse, Shigeru; and Takashima, Masatake, 3,946,407.

Takashino, Shizuo, to Sony Corporation. Automatic shutoff mechanism for magnetic tape recording and reproducing apparatus. 3,946,436, Cl. 360-74.000.

Takasu, Tadahiro: *See—*
Nakao, Hisaji; Fukuma, Nobuo; Matsubara, Hideyuki; Takasu, Tadahiro; and Yoneda, Takao, 3,946,212.

Takayama, Takashi: *See—*
Sato, Tutomu; Horikawa, Kiyomi; Hiroi, Masayoshi; Umino, Shigeyuki; Yamada, Toshio; Takayama, Takashi; and Kayamori, Toru, 3,945,551.

Takeda Chemical Industries, Ltd.: *See—*
Nagamatsu, Kazuo; Kinoshita, Yoshitsugu; Kawajiri, Seizo; and Uda, Yoshiaki, 3,945,796.
Takahashi, Takeshi; Kawahara, Kenji; Takahashi, Toshiyuki; Kato, Koichi; and Yamazaki, Yoshio, 3,945,888.

Takemoto, Toyoki; and Kuroda, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Method of making integrated circuits. 3,945,347, Cl. 29-577.000.

Takeuchi, Hisaharu: *See—*
Yagi, Motoi; Akino, Morio; and Takeuchi, Hisaharu, 3,945,582.

Takeuchi, Toru: *See—*
Sumita, Masujiro; Konno, Ryozo; and Takeuchi, Toru, 3,945,833.

Takino, Masuichi; Kurosaki, Teikichi; and Odaka, Munehiko, to Nippon Zoki Pharmaceutical Co., Ltd. 6-L-dihydroxyethyl-2,4,7-trioxo-8-D-ribityl pteridine and process for producing the same. 3,946,012, Cl. 260-251.500.

Talbert, Sherwood G.: *See—*
Pritz, Howard B.; and Talbert, Sherwood G., 3,945,379.

Tamagawa, Toru: *See—*
Murano, Minoru; Yanabu, Satoru; Tamagawa, Toru; Takahashi, Nobuyuki; Okumura, Hiroyuki; and Ohhashi, Hiroshi, 3,946,179.

Tamblyn, Robert Teudar. Air conditioning method and system. 3,945,432, Cl. 165-22.000.

Tanabe, Geniti: *See—*
Tomioka, Shozo; Matsushima, Shujiro; Koezuka, Yokichi; Tanabe, Geniti; and Nakasyo, Koichi, 3,945,230.

Tanabe, Masato: *See—*
Crowe, David F.; Peters, Richard H.; Tanabe, Masato; and Detre, George, 3,946,052.

Tanaka, Akio: *See—*
Ma, John; and Tanaka, Akio, 3,946,319.

Tanaka, Keiji: *See—*
Moriyama, Inao; Tanaka, Keiji; Yujiro, Ando; and Ohara, Katsunobu, 3,945,725.

Tangonan, Gregory L.: *See—*
Hunsperger, Robert G.; Stoll, Harold M.; Tangonan, Gregory L.; and Yariv, Amnon, 3,945,110.

Taniguchi, Tadasu; Hosaka, Iwao; and Yoshida, Shigeru, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Information writing device. 3,946,202, Cl. 235-61.70B.

Taniguchi, Tadasu; Hosaka, Iwao; and Yoshida, Shigeru, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Card reader protecting device. 3,946,204, Cl. 235-61.11R.

Tanikoshi, Kinji, to Canon Kabushiki Kaisha; and Canon Seiki Kabushiki Kaisha. Brushless motor driving system. 3,946,292, Cl. 318-138.000.

Tanno, Norithiko: *See—*
Yamada, Hirotada; Tobiki, Hisao; Nakatsuka, Iwao; Tanno, Norithiko; Shimago, Kozo; and Nakagome, Takenari, 3,945,995.

Tarrant, Duel J.: *See—*
Wilson, Clyde H.; Cross, Donald M.; Dupuy, James A.; and Tarrant, Duel J., 3,945,450.

Tarui, Yasuo; and Hayashi, Yutaka, to Kogyo Gijutsuin. High frequency field-effect transistors and method of making same. 3,946,424, Cl. 357-42.000.

Tate, Jack F.; Maddox, Jim, Jr.; and Shupe, Russell D., to Texaco Inc. Method for stimulating well production. 3,945,438, Cl. 166-307.000.

Tate, Jack F.: *See—*
Shupe, Russell D.; Maddox, Jim, Jr.; and Tate, Jack F., 3,945,439.

Tatsukawa, Keizo: *See—*
Fujimoto, Yasuo; Tatsukawa, Keizo; Nagaoka, Koichi; Nagumo, Masayuki; and Nagai, Kiichi, 3,945,952.

Tauchi, Syoji: *See—*
Nishizawa, Jun-ichi; Sasaki, Ichiemon; Ishida, Katsuhiko; Tauchi, Syoji; Nishimura, Takeshi; Seki, Takeo; and Kozuma, Noboru, 3,946,270.

Tauscher, Manfred; Goring, Joachim; Busch, Wolfgang; and Rohte, Oskar, to Wulfing, Johann A. 1,3-bis(Beta-ethylhexyl)-5-amino-5-methylhexahydropyrimidine-pyridine-3-carboxylate, process for its preparation and pharmaceutical compositions containing this compound. 3,946,013, Cl. 260-256.40N.

Taylor, Frank L.: *See—*
Anderson, Clarence A.; and Taylor, Frank L., 3,946,243.

Taylor, Monte L. Cloth tube everter and method of operation. 3,945,542, Cl. 223-42.000.

Taylor, Roger Keith, to Tourdelos Limited. Actuators. 3,945,304, Cl. 92-140.000.

TDK Electronics Co., Ltd.: *See—*
Miura, Taro; and Yamamoto, Takahiro, 3,946,308.
Yoshioka, Tsunehiko; Oyamada, Yasutaka; Iwaya, Shoichi; and Sato, Minoru, 3,946,290.

Teatini, Giuseppe. Regulating valve. 3,945,393, Cl. 137-220.000.

Tech Systems Corporation: *See—*
Vilkaitis, Hugo L., 3,946,343.

Technical Operations, Incorporated: *See—*
Graser, Michael, Jr., 3,945,731.

TED Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec: *See—*
Schultz, Bodo, 3,946,167.

Teijin Ltd.: *See—*
Iwata, Kaoru; and Hara, Shigeyoshi, 3,946,033.

Teitel, Sidney: *See—*
Brossi, Arnold; Kloetzer, Wilhelm; and Teitel, Sidney, 3,946,041.

Tektronix, Inc.: *See—*
Beeck, Carlos Luis, 3,946,225.

Tel-Tone Corporation: *See—*
Asmussen, Daniel Richard; and Breen, Barry Cameron, 3,946,163.

Teledyne, Inc.: *See—*
Skrabek, Emanuel Andrew; and Trimmer, Donald Smith, 3,945,855.

Teledyne Industries, Inc.: *See—*
Regueiro, Jose F., 3,945,365.

Teleflex Incorporated: *See—*
Horvath, Louis T.; and Allen, Clifford H., 3,945,260.
Ion, John C.; and Zieber, George M., Jr., 3,945,268.

Teletype Corporation: *See—*
Berry, James M.; Hauser, Anthony J.; and Swanson, Carl D., 3,946,405.
Lindberg, Arthur F., 3,945,481.
McClaughry, Michael J., 3,946,245.

Templeton, Charles C.: *See—*
Closmann, Philip J.; Drinkard, Gary; Street, Evan H.; Templeton, Charles C.; and Tham, Min Jack, 3,945,679.

Tepper, Robert J.: *See—*
Figiel, Francis J.; Tepper, Robert J.; and Dunn, Michael L., 3,945,932.

Terauchi, Kiyoshi: *See—*
Toyoda, Hiroshi; Shimizu, Shigemi; Terauchi, Kiyoshi; and Hiraga, Masaharu, 3,945,765.

Terhune, George E. Rotating lever-actuated pumping apparatus. 3,945,763, Cl. 417-211.000.

Tessenderlo Chemie S.A.: *See—*
Delaunois, Yvon; Hestermans, Pierre; Leroy, Georges; Peerts, Fernand; and Wilante, Claude, 3,946,083.

Texaco Development Corporation: *See—*
Marion, Charles P.; and Reynolds, Blake, 3,945,942.

Texaco Inc.: *See—*
Shupe, Russell D.; Maddox, Jim, Jr.; and Tate, Jack F., 3,945,439.
Smith, Harry Davis, Jr., 3,946,226.
Tate, Jack F.; Maddox, Jim, Jr.; and Shupe, Russell D., 3,945,438.

Texas Alkyls, Inc.: *See—*
Malpass, Dennis B.; Heilig, George Charles; and Foley, Thomas C., 3,946,058.

Texas Instruments Inc.: *See—*
Buss, Dennis Darcy, 3,946,248.
Collins, Dean Robert; and Clairborne, Lewis T., 3,946,247.
Hartmann, Clinton S., 3,946,342.
Hartsell, Glenn A., 3,946,420.
Hartsell, Glenn A.; and Kmetz, Allan R., 3,946,421.
Holder, Paul Dalton, 3,946,182.
Nelson, Hjalmar N., 3,946,352.
Van Dierendonck, Jerry L., 3,946,216.

Textron Inc.: *See—*
Halwes, Dennis R., 3,945,628.
Johnston, Mervyn B., 3,945,354.
Kellerman, Rudolph; and Fischer, James L., 3,945,478.
Olmr, Jaroslav Jiri, 3,945,288.

Tham, Min Jack: *See—*
Closmann, Philip J.; Drinkard, Gary; Street, Evan H.; Templeton, Charles C.; and Tham, Min Jack, 3,945,679.

Tharp, James A.: *See—*
Oster, Clark L.; and Tharp, James A., 3,946,346.

Thaxter, James B.: *See—*
Lustig, Claude D.; and Thaxter, James B., 3,946,267.

Therkelsen, Louis J. Control for water closets. 3,945,057, Cl. 4-67.00R.

Thiel, Reinhard; Rosenbaum, Heinz Jorg; and Heller, Karl Heinz, to Bayer Aktiengesellschaft. Process for oxidating hydrocarbons. 3,946,077, Cl. 260-586.0AB.

Thiele, John R.: *See—*
Rudder, Walter H.; Braden, William D., deceased; McEvoy, Charles J.; Dodson, Stokes R., Jr.; Thiele, John R.; and Livgren, Allen L., 3,945,866.

Thiers, Robrecht Julius: *See—*
Zorn, Hugo; Kuffner, Karl; Glockner, Hans; Willems, Jozef Frans; and Thiers, Robrecht Julius, 3,945,829.

Thiokol Corporation: *See—*
Sossong, Henry J., 3,945,539.

Thomas, H. Ronald: *See—*
Parent, Richard A.; and Thomas, H. Ronald, 3,945,823.

Thomas, Ian M., to Owens-Illinois, Inc. Method for producing stannic tertiary alkoxide. 3,946,056, Cl. 260-429.700.

Thomas, Ian M., to Owens-Illinois, Inc. Liquid octa 2-lower alkoxy ethoxides of aluminum and (magnesium or calcium). 3,946,102, Cl. 423-600.000.

Thomas, Robert E.: *See—*
Brobeck, William M.; Givins, John S., Jr.; Meads, Philip F., Jr.; and Thomas, Robert E., 3,946,220.

Thompson, Vivienne J. Covered artist palette apparatus. 3,945,490, Cl. 206-1.700.

Thompson, Walter F.: *See—*
Dover, Thomas J.; and Thompson, Walter F., 3,945,182.

Thomson-CSF: *See—*
Bonnel, Michele, 3,945,113.
Puech, Claude, 3,945,790.

Thomson, Morton W.; and Trout, Mitchel A., to Dymo Industries, Inc. Portable transaction-log recorder. 3,945,316, Cl. 101-45.000.

Thorp, Peter M., to Rank Xerox Ltd. Latching apparatus. 3,946,172, Cl. 200-44.000.

Thorsoe, Flemming, to Danfoss A/S. Phase-initiation control arrangement, particularly for a three-phaseconsumer unit. 3,946,304, Cl. 323-24.000.

Thorson, Eric K.: *See—*
Codomo, Joseph; and Thorson, Eric K., 3,946,364.

Tidland Corporation: *See—*
Ochs, Gordon M.; and Wheeler, Raymond L., 3,945,583.

Tilkens, Lucien, to Yamaha Hatsudoki Kabushiki Kaisha. Vehicular springing means. 3,945,626, Cl. 267-64.00R.

Timex Corporation: *See—*
Lewis, Richard Walter, 3,945,850.

Timmerman, William O. Game table. 3,945,639, Cl. 273-3.00A.

Tinyakov, Viktor Gurievich: *See—*
Milman, Boris Samoilovich; Mirzoian, Genrikh Sergeevich; Strizhov, Gennady Sergeevich; Tinyakov, Viktor Gurievich; Doroschenko, Pavel Petrovich; Karsky, Vladimir Evgenievich; Levin, Moisei Markovich; Krapukhin, Viktor Mikhailovich; and Semenov, Pavel Vladimirovich, 3,945,427.

Tipper, Maynard J. G.: *See—*
Marietta, James W., Jr.; and Tipper, Maynard J. G., 3,945,171.

Tirelli, Paolo, to Atos Oleodinamica S.p.A. Electrically modulated hydraulic-pressure regulating valve. 3,945,399, Cl. 137-529.000.

Tkaciukas, Eugenia. Self-feeding bottle. 3,945,524, Cl. 215-11.00R.

Tobiki, Hisao: *See—*
Yamada, Hirotada; Tobiki, Hisao; Nakatsuka, Iwao; Tanno, Norithiko; Shimago, Kozo; and Nakagome, Takenari, 3,945,995.

Tobita, Susumu; Shimoishizaka, Masashi; Sumita, Yuzo; Oishi, Isamu; and Kato, Koji, to Furukawa Electric Co., Ltd. Method and apparatus for forming a corrugated waveguide. 3,945,552, Cl. 228-17.500.

Todd, Peter Frank, to Imperial Chemical Industries Limited. Dimerisation process and catalyst. 3,946,066, Cl. 260-465.80D.

Toho Chemical Industry Co., Ltd.: *See—*
Sugiyama, Noboru; Suzuki, Masamichi; Watanabe, Katami; Sugiyama, Keiichi; Tadenuma, Hachiro; Kato, Takashi; Kaneda, Ryoji; and Yoshino, Makoto, 3,945,930.

Tokai TRW & Co., Ltd.: *See—*
Abe, Michio, 3,945,739.

Tokuyama Soda Kabushiki Kaisha: *See—*
Mizutani, Yukio; Izumi, Yusuke; and Watanabe, Yoshiaki, 3,946,079.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Harada, Nozomu; and Iwasawa, Mineo, 3,946,223.
Ikeuchi, Jun-ichiro; and Tsutsumi, Teruo, 3,946,403.
Murano, Minoru; Yanabu, Satoru; Tamagawa, Toru; Takahashi, Nobuyuki; Okumura, Hiroyuki; and Ohhashi, Hiroshi, 3,946,179.
Yagi, Motoi; Akino, Morio; and Takeuchi, Hisaharu, 3,945,582.

Tolmie, Robert J., to Sperry Rand Corporation. Shaver inner cutter. 3,945,118, Cl. 30-346.510.

Tominaga, Nobuyoshi: *See—*
Okano, Ryozo; and Tominaga, Nobuyoshi, 3,945,463.

Tomioka, Shozo; Matsushima, Shujiro; Koezuka, Yokichi; Tanabe, Geniti; and Nakasyo, Koichi, to Kabushiki Kaisha Komatsu Seisakusho. Process for automatically interchanging die assemblies in a metal working press and apparatus therefor. 3,945,230, Cl. 72-30.000.

Tomita, Masahiro: *See—*
Kaneko, Fuminori; Ureshino, Kashirou; and Tomita, Masahiro, 3,945,577.

Tomlinson, Kenneth; and Harrison, Michael, to Colgate-Palmolive Company. Dentifrice. 3,946,108, Cl. 424-49.000.

Tone Boring Company Limited: *See—*
Ikeda, Nobuhisa, 3,945,445.

Topalidi, Dmitry Nikolaevich: *See—*
Listov, Petr Nikolaevich; Ganiev, Madzhid Saidovich; Buromsky, Vladimir Ivanovich; Bogdanova, Lidia Ivanovna; Kalafatov, Enver Tefikovich; Topalidi, Dmitry Nikolaevich; Rodionov, Vitaly Petrovich; Junusov, Edem Idrisovich; and Fedorov, Valery Pavlovich, 3,945,179.

Toray Industries, Inc.: *See—*
Yamazaki, Chikayasu; Nakayama, Takao; and Kawabe, Noriyuki, 3,945,181.

Toray Textiles, Inc.: *See—*
Matsumoto, Fukuo; Kondo, Kikuo; and Shibata, Masao, 3,945,222.

Torgow, Eugene N.: *See—*
Oltman, Henry G., Jr.; Pelner, Nathan; and Torgow, Eugene N., 3,946,339.

Torp, Bruce A.; and Shaffer, Edward C., to Minnesota Mining and Manufacturing Company. Semiconductive metal chalcogenides of the type Cu_3VS_4 and methods for preparing them. 3,945,935, Cl. 252-62.30V.

Tortorici, Carl. Device for drawing objects in perspective. 3,945,123, Cl. 33-77.000.

Toth, Alex, to Ellis Corporation. Rotary centrifugal machine. 3,945,921, Cl. 210-78.000.

Toth, Paul: *See—*
Hohwart, George; Toth, Paul; and Cross, Kenneth O., 3,945,652.

Tourdelos Limited: *See—*
Taylor, Roger Keith, 3,945,304.

Towa Kako Co., Ltd.: *See—*
Yamamatsu, Kenichi; Yamada, Shozo; Nouni, Hiroaki; and Yokoyama, Shuzi, 3,945,464.

Townsend, Herbert E., Jr.; and Horton, James B., to Bethlehem Steel Corporation. Means for preventing damage to jacketed flexible pumping strand. 3,945,795, Cl. 21-61.000.

Toyo Boseki Kabushiki Kaisha: *See—*
Furukawa, Kaoru; Tsukamoto, Chiaki; Nagai, Hiroshi; Matsunami, Koichi; and Nagano, Hikoichi, 3,946,089.

Toyo Ink Manufacturing Company, Ltd.: *See—*
Sumita, Masujiro; Konno, Ryozo; and Takeuchi, Toru, 3,945,833.

Toyo Kogyo Co., Ltd.: *See—*
Sumida, Shizuo; Nii, Kazuo; Ito, Hisatsugu; Ueda, Atsushi; and Ishii, Mitsuaki, 3,946,362.

Toyo Seikan Kaisha Limited: *See—*
Imazu, Katsuhiro; and Miyata, Masao, 3,945,231.

Toyoda, Hiroshi; Shimizu, Shigemi; Terauchi, Kiyoshi; and Hiraga, Masaharu, to Sankyo Electric Co., Ltd. Refrigerant compressor. 3,945,765, Cl. 417-269.000.

Toyoda, Kenji, to Nippon Kogaku K.K. Motor drive system for camera. 3,946,409, Cl. 354-173.000.

Toyoda-Koki Kabushiki Kaisha: *See—*
Tsujiuchi, Toshio, 3,945,692.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Morita, Minoru, 3,945,776.
Murase, Genyo; Mineda, Hisahal; and Yamaguchi, Yozo, 3,945,662.
Tsutsumi, Masanobu; and Hanai, Kiyoshi, 3,945,665.

Toyota Jidosha Kokyo Kabushiki Kaisha: *See—*
Nakao, Hisaji; Fukuma, Nobuo; Matsubara, Hideyuki; Takasu, Tadahiro; and Yoneda, Takao, 3,946,212.

Toyota Jidosha Kokyo Rabushiki Kaisha: *See—*
Nakao, Hisaji; Fukuma, Nobuo; Matsubara, Hideyuki; Takasu, Tadahiro; and Yoneda, Takao, 3,946,212.

Transactron, Inc.: *See—*
Brobeck, William M.; Givins, John S., Jr.; Meads, Philip F., Jr.; and Thomas, Robert E., 3,946,220.

Transmatic Fyllan Limited: *See—*
Marks, David Alex, 3,945,532.

Treuner, Uwe D.; and Breuer, Hermann, to E. R. Squibb & Sons, Inc. (Carbamoylthi oacetyl)cephalosporin derivatives. 3,946,001, Cl. 260-243.00C.

Trimmer, Donald Smith: *See—*
Skrabek, Emanuel Andrew; and Trimmer, Donald Smith, 3,945,855.

Trofimow, Alex: *See—*
Bleyle, Merrill; DelVecchio, William D.; and Trofimow, Alex, 3,946,139.

Trout, Mitchel A.: *See—*
Thomson, Morton W.; and Trout, Mitchel A., 3,945,316.

TRW Inc.: *See—*
Herbenar, Edward J., 3,945,737.

Tsao, Utah, to Lummus Company, The. Process for making protein from hydrocarbons. 3,946,114, Cl. 426-60.000.

Tsubakimoto, Tsuneo; and Fuzikawa, Iwao, to Nippon Shokubai Kazaku Kogyo Co. Ltd. Process for producing finely divided hardened resins. 3,945,980, Cl. 260-39.00P.

Tsuji, Rokuro; and Niwa, Toshinori, to Hitachi, Ltd. Method for coating metal surface with carbon. 3,945,898, Cl. 204-181.000.

Tsujikawa, Atsushi; and Morimoto, Yoshio, to Omron Tateisi Electronics Co. Electronic cash register capable of calculating sales tax. 3,946,217, Cl. 235-156.000.

Tsujiuchi, Toshio, to Toyoda-Koki Kabushiki Kaisha. High rigidity fluid bearing and method for manufacturing the same. 3,945,692, Cl. 308-9.000.

Tsukada, Susumu: *See—*
Matsui, Isamu; Sakai, Shoji; Tsukada, Susumu; and Kawarabayashi, Susumu, 3,945,488.

Tsukamoto, Chiaki: *See—*
Furukawa, Kaoru; Tsukamoto, Chiaki; Nagai, Hiroshi; Matsunami, Koichi; and Nagano, Hikoichi, 3,946,089.

Tsukushi, Masanori: *See—*
Yoshioka, Yoshio; and Tsukushi, Masanori, 3,946,184.

Tsuruta, Masaru: *See—*
Takamizawa, Koji; Shimizuhata, Shitiro; Shinonaga, Akinori; and Tsuruta, Masaru, 3,946,181.

Tsutsumi, Masanobu; and Hanai, Kiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Inflatable type occupant restraint device for automobile or the like. 3,945,665, Cl. 280-150.0AB.

Tsutsumi, Teruo: *See—*
Ikeuchi, Jun-ichiro; and Tsutsumi, Teruo, 3,946,403.

Tsuyama, Yoshizo, to Nippon Kokan Kabushiki Kaisha; and Eagle Clamp Co., Ltd. Block loader. 3,945,675, Cl. 294-81.00R.

Tung, Chi Fang; and Laird, James A., to Minnesota Mining and Manufacturing Company. Transparent glass microspheres and products made therefrom. 3,946,130, Cl. 428-325.000.

Tuomaala, Jorma Aarne Kullervo; and Myreen, Bertel, to A. Ahlstrom Osakeyhtio. Continuous method and device for withdrawing particulate material from a container. 3,945,615, Cl. 259-6.000.

Turner, James Glenn, Jr. Engine modification. 3,945,367, Cl. 123-198.00F.

Turner, Trevor John: *See—*
Gibson, Andrew; and Turner, Trevor John, 3,945,320.

Tuseth, Robert D.: *See—*
Dabney, William C.; Kristoff, Basil L.; Tuseth, Robert D.; and Hink, John H., 3,945,380.

Tustison, Galen F., to Hughes Aircraft Company. Single frequency signalling in a radiotelephone communication system with idle condition signal generator at one terminal activated by another terminal. 3,946,315, Cl. 325-55.000.

Tweed, David G.; and LaWhite, Eric, to Brattle Instrument Corporation. Tocodynamometer. 3,945,373, Cl. 128-2.00S.

Tyssee, Donald A., to Monsanto Company. Electrolytic carboxylation of acetonitrile and alpha-substituted acetonitriles. 3,945,896, Cl. 204-59.00R.

U.M.E.C. - Boydell (Belting) Limited: *See—*
Norton, Ellis Charles, 3,945,487.
Ube-Nitto Kasei Co., Ltd.: *See—*
Takahashi, Mitsuhiro; and Senoo, Tadao, 3,946,097.
Uchino, Kenju, to Uchino, Yehan. Device for preventing error in slide calipers. 3,945,121, Cl. 33-147.00T.
Uchino, Yehan: *See—*
Uchino, Kenju, 3,945,121.
Uchiyama, Hiromichi: *See—*
Hamada, Mitsuharu; and Uchiyama, Hiromichi, 3,945,455.
Uda, Yoshiaki: *See—*
Nagamatsu, Kazuo; Kinoshita, Yoshitsugu; Kawajiri, Seizo; and Uda, Yoshiaki, 3,945,796.
Ueda, Atsushi: *See—*
Sumida, Shizuo; Nii, Kazuo; Ito, Hisatsugu; Ueda, Atsushi; and Ishii, Mitsuaki, 3,946,362.
Ueda, Harutoshi; Suzuki, Naoyuki; and Nagao, Masami, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Non-combustible molding material. 3,945,840, Cl. 106-87.000.
Ueki, Atsufumi; Nishida, Nobuo; and Takahashi, Shinji, to Nippon Electric Co., Ltd. Multiple recording system for video signals and optical images. 3,946,430, Cl. 358-2.000.
Ueno, Seiichi: *See—*
Anazawa, Shinzo; Ueno, Seiichi; Nagasako, Isamu; Nawa, Tadashi; Irie, Toshiaki; and Sando, Shigeru, 3,946,428.
Ulyanov, Lev Petrovich; Borisenkov, Oleg Nikolaevich; Kastorskaya, Natalya Nikolaevna; Vinogradov, Georgy Vladimirovich; Yanovsky, Jury Grigorievich; and Sergeenkov, Sergei Ivanovich. Method of measuring dynamic characteristics of materials and device for effecting same. 3,945,242, Cl. 73-15.400.
Umemoto, Sueo: *See—*
Nikaido, Norio; Shirai, Shinji; Iihashi, Mototaka; and Umemoto, Sueo, 3,945,899.
Umino, Shigeyuki: *See—*
Sato, Tutomu; Horikawa, Kiyomi; Hiroi, Masayoshi; Umino, Shigeyuki; Yamada, Toshio; Takayama, Takashi; and Kayamori, Toru, 3,945,551.
Underwood, Warren H.: *See—*
Blair, James M.; Sebring, Michael; Underwood, Warren H.; and Bley, William P., 3,946,117.
Union Carbide Corporation: *See—*
Kordesch, Karl V.; and Kozawa, Akiya, 3,945,847.
Reedy, James Dale, 3,946,057.
Union Oil Company of California: *See—*
Ward, John W., 3,945,943.
Uniroyal Aktiengesellschaft: *See—*
Poque, Dionysius Josef; Senger, Gerhard Franz-Josef; and Vogler, Hans Jurgen, 3,945,421.
Uniroyal, Inc.: *See—*
Batorewicz, Wadim, 3,945,954.
Hunter, Byron A.; and Hollmann, Gerald J., 3,946,064.
Mao, Chung-Ling; and Bakker, Lynn A., 3,946,038.
Robertson, John R., 3,945,981.
Unitas S.A.: *See—*
Van de Moortele, Gudio, 3,945,772.
United Aircraft Corporation: *See—*
Nickols, Richard C., Jr., 3,945,844.
United Kingdom Atomic Energy Authority: *See—*
Hind, John Richard; and Durston, John Graham, 3,945,883.
United States Gypsum Company: *See—*
Wendt, Alan C., 3,945,167.
Wendt, Alan C., 3,945,741.
United States of America
Agriculture: *See—*
Jurd, Leonard, 3,946,047.
Weaver, Merle L.; Hautala, Earl; and Nonaka, Masahide, 3,946,116.
Air Force: *See—*
Haldeman, Charles W., III, 3,946,349.
Army: *See—*
Boswell, George T., 3,945,323.
Durand, Philip E.; McManus, Lawrence R.; and Claus, William D., Jr., 3,945,122.
Hacskaylo, Michael, 3,946,416.
Morganstein, Melvyn I., 3,945,845.
Roberts, Thomas G.; Shatas, Romas A.; Meyer, Harry C., III; and Stettler, John D., 3,946,236.
Roberts, Thomas G.; Shatas, Romas A.; Meyer, Harry C., III; and Stettler, John D., 3,946,240.
Whitman, Robert E., 3,946,392.
Energy Research and Development Administration: *See—*
Donath, Ernest E., 3,945,809.
General Counsel Code-GP: *See—*
United States of America, National Aeronautics and Space Administration; Miller, Charles G.; and Bartera, Ralph E., 3,945,801.
Interior: *See—*
Paice, Derek A.; and Shimp, Alan B., 3,946,279.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Haynie, Cyrus C.; and Messineo, Samuel V. Apparatus for positioning modular components on a vertical or overhead surface. 3,945,879, Cl. 156-556.000.
Miller, Charles G.; and Bartera, Ralph E., to United States of America, General Counsel Code-GP. Indicator providing continuous indication of the presence of a specific pollutant in air. 3,945,801, Cl. 23-254.00E.
Navy: *See—*
Adolph, Horst G., 3,946,085.
Brown, Stanley R., 3,945,241.
Carlson, Bertil V.; and Zapf, Donald C., 3,945,322.
Hughes, Richard Smith; and Atkinson, Robert E., 3,946,383.
Katz, Joel, 3,946,322.
Keck, William G., 3,946,354.
Kinder, Floyd A., 3,945,716.
Kossiakoff, Alexander; and Austin, James R., 3,946,382.
Mohon, Windell N.; Derderian, George; and Breglia, Denis R., 3,945,133.
Paszyc, Aleksy J.; Pal, Dharam; and Curry, John B., 3,945,920.
Pollack, Slava A.; and Nicolai, Van O., 3,946,331.
Robison, Leslie P., 3,945,295.
Schmidt, Richard, 3,945,555.
Westaway, Thomas A., 3,946,384.
Transportation: *See—*
Ewen, Harold I., 3,946,385.
United Energy Research and Development Administration: *See—*
Salzman, Gary C.; and Mullaney, Paul F., 3,946,239.
U. S. Philips Corporation: *See—*
Buro, Paul, 3,946,400.
de Hedouville, Philippe, 3,945,226.
Langer, Erich, 3,946,435.
Schmidt, Klaus Peter; and Hill, Bernhard, 3,946,370.
van Beukering, Henricus Cornelis Johannes; and Michels, Albertus Peter Johannes, 3,945,430.
Van Vucht, Johannes Hendrikus Nicolaas; and Fransen, Jan Josephus Bernardus, 3,945,949.
Verhoeven, Leonardus Adrianus Johannes, 3,946,265.
United States Steel Corporation: *See—*
Marcozzi, Arthur J., 3,945,877.
United Technologies Corporation: *See—*
Bradley, Floyd P.; and Smith, Lawrence S., 3,945,199.
Brown, Bruce T., 3,945,240.
Hasbrouck, Larkin M.; and Fastaia, Anthony J., 3,946,305.
Hasbrouck, Larkin M., 3,946,306.
Unitika Limited: *See—*
Sakata, Hiroshi; Okamoto, Takashi; and Hasegawa, Hirozo, 3,946,091.
Universal Forest Products, Inc.: *See—*
Knoth, Wayne, 3,945,249.
Universal Instruments Corporation: *See—*
Whiting, Roy M.; Soth, Henry J.; and Ragard, Phillip A., 3,945,100.
Zemek, Albert W.; Orzelek, Frank Joseph; and Ziemba, Mike L., 3,945,283.
Universal Oil Products Company: *See—*
Vosganiantz, Jean-Jacques, 3,945,950.
Universal Propulsion Co.: *See—*
Marion, Frank A.; and McSpadden, Hugh J., 3,945,202.
University of Akron, The: *See—*
Farona, Michael F.; and White, James F., 3,946,072.
University of Illinois Foundation: *See—*
Kansy, Robert, 3,945,099.
University of Melbourne: *See—*
Crock, Gerard William; and Pericic, Ljubomir, 3,945,712.
Upjohn Company, The: *See—*
Kelly, Robert C., 3,946,046.
UPO Oskeyhtio: *See—*
Kinnunen, Paavo; and Lukkarinen, Viljo, 3,946,286.
Urban, Horst: *See—*
Boeke, Uwe; Hennemann, Lothar Roland; Hohorst, Wolfgang; and Urban, Horst, 3,945,701.
Ureshino, Kashirou: *See—*
Kaneko, Fuminori; Ureshino, Kashirou; and Tomita, Masahiro, 3,945,577.
USM Corporation: *See—*
Babson, Edward S.; and Gorini, Robert F., 3,945,074.
Gray, Richard W., 3,945,632.
Vaillette, Bernard D., to Cincinnati Milacron-Heald Corporation. Toolhead. 3,945,694, Cl. 308-184.00A.
Vakuum Vulk Holdings Ltd.: *See—*
Schelkmann, Wilhelm, 3,945,871.
Valmet Oy: *See—*
Hyytinen, Timo, 3,945,296.
van Beijnen, Christianus Antonius Maria, to Reactor Centrum Nederland (Stichting). Method of manufacturing superconductors of β-tungsten structure. 3,945,859, Cl. 148-11.50R.
van Berkum, Petrus A., to Zenith Radio Corporation. Electronic timepiece having complementary electro-optical and electro-mechanical displays. 3,945,191, Cl. 58-4.00A.
van Beukering, Henricus Cornelis Johannes; and Michels, Albertus Peter Johannes, to U.S. Philips Corporation. Rotary regenerative heat-exchanger. 3,945,430, Cl. 165-9.000.
van de Loo, Hansjuergen, to Acme-Cleveland Corporation. Shaft positioning mechanism. 3,946,298, Cl. 318-685.000.
Van de Moortele, Gudio, to Unitas S.A. Pumps for transferring small quantities of dosed liquids. 3,945,772, Cl. 417-489.000.
van der Drift, Johannes Karel: *See—*
Bruynes, Cornelis Adrianus; and van der Drift, Johannes Karel, 3,945,994.
Vander Horst, John; and Dunn, Myron, to Wilkerson Corporation. Multi-function air treatment unit. 3,945,465, Cl. 184-6.240.

van der Lely, Ary: *See—*
van der Lely, Cornelis; and van der Lely, Ary, 3,945,441.
van der Lely, Cornelis; and van der Lely, Ary. Soil cultivating implements. 3,945,441, Cl. 172-43.000.
Van Dierendonck, Jerry L., to Texas Instruments Incorporated. Electronic calculator system having serial transfer of instruction word fields to decode arrays. 3,946,216, Cl. 235-156.000.
Van Dort, Jacobus Maurits, to Hollandse Signaalapparaten B.V. Method of manufacturing twistless yarn and the product thereof. 3,945,186, Cl. 57-153.000.
Van Houten, Roland W.: *See—*
Forbes, Gordon B.; and Van Houten, Roland W., 3,945,213.
VanSant, James: *See—*
Kellow, Mazin; VanSant, James; and Bonneville, Jacques, 3,946,142.
Van Vucht, Johannes Hendrikus Nicolaas; and Fransen, Jan Josephus Bernardus, to U. S. Philips Corporation. Alkali metal vapour generator. 3,945,949, Cl. 252-514.000.
Vargay, Zoltan: *See—*
Mlinko, Sandor; Banfi, Dezso; Gacs, Istvan; Payer, Karoly; Otvos, Laszlo; Vargay, Zoltan; Dobis nee Farkas, Emilia; and Palagyi, Tivadar, 3,945,797.
Vasicek, David J.: *See—*
Somerville, John G.; and Vasicek, David J., 3,945,608.
Vater, Wulf: *See—*
Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 3,946,027.
Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 3,946,028.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,946,026.
VEB Chemieanlagenbau-und Montegekombinat: *See—*
Jagusch, Leonhard; and Schonherr, Werner, 3,945,922.
Veb Pentacon Dresden: *See—*
Hahn, Werner; Scholze, Herbert; and Seifert, Rolf, 3,946,412.
Veda, Inc.: *See—*
Wirsbinski, James L., 3,945,332.
Veeder Industries, Inc.: *See—*
Fleischer, Donald Whiting, 3,946,210.
Lucas, Richard K., 3,946,219.
Velsicol Chemical Corporation: *See—*
Richter, Sidney B.; and Krenzer, John, 3,946,043.
Richter, Sidney B.; and Krenzer, John, 3,946,044.
Richter, Sidney B.; and Krenzer, John, 3,946,045.
Verhille, Karel Eugeen, to Agfa-Gevaert N.V. Image intensification process. 3,945,822, Cl. 96-1.00R.
Verhoeven, Leonardus Adrianus Johannes, to U.S. Philips Corporation. Vidicon with grid wire angles selected to minimize chrominance signal interference. 3,946,265, Cl. 313-390.000.
Vernaleken, Hugo: *See—*
Margotte, Dieter; and Vernaleken, Hugo, 3,946,090.
Vernam, William D.: *See—*
Anderson, William A.; Rogers, Ralph W., Jr.; and Vernam, William D., 3,945,861.
Vessman, Jorgen; Svahn, Carl Magnus; and Hartvig, Per, to Pierce Chemical Company. Reagent for electroncapture detection and tertiary amines. 3,946,063, Cl. 260-463.000.
Veyrassat, Louis, to Maillefer S.A. Wire-winding machine. 3,945,580, Cl. 242-25.00A.
Vicendese, Anthony P.; and Vicendese, Frank. Combination power driven lawn-mower aerator. 3,945,176, Cl. 56-11.800.
Vicendese, Frank: *See—*
Vicendese, Anthony P.; and Vicendese, Frank, 3,945,176.
Vicic, John C.; and Sicka, Richard W., to Horizons Incorporated a division of Horizons Research Incorporated. Vulcanization of fluoroalkoxyphosphazene polymers. 3,945,966, Cl. 260-42.150.
Victor Company of Japan, Ltd.: *See—*
Takahashi, Nobuaki, 3,946,330.
Victor Comptometer Corporation: *See—*
Altmann, Bert Lane; Gregg, Robert Milton; and Gioia, Norman Frank, 3,946,438.
Vidal, Roger; and Gourmandy, Raymond, to Rhone-Poulenc-Textile SA. Elongated textile product. 3,946,133, Cl. 428-400.000.
Videonics of Hawaii, Inc.: *See—*
Wohlmut, Peter G.; and Neu, Frank D., 3,946,367.
Viking Pallet Corporation: *See—*
Colson, Donald W., 3,945,549.
Vilkaitis, Hugo L., to Tech Systems Corporation. Bendable wave guide. 3,946,343, Cl. 333-95.00A.
Villaume, Frederick George, to American Cyanamid Company. Method for improving the stability of detergent bleach compositions. 3,945,937, Cl. 252-102.000.
Vincent, William; and Zeller, Hartmut, to Wander Ltd. High protein bread substitute and method for preparing same. 3,946,120, Cl. 426-532.000.
Vinogradov, Georgy Vladimirovich: *See—*
Ulyanov, Lev Petrovich; Borisenkov, Oleg Nikolaevich; Kastorskaya, Natalya Nikolaevna; Vinogradov, Georgy Vladimirovich; Yanovsky, Jury Grigorik vich; and Sergeenkov, Sergei Ivanovich, 3,945,242.
Violet, Jean-Louis: *See—*
Allera; Jean-Louis; Bergeri, Jacques; Perroud, Paul; Pleyber, Gaetan; and Violet, Jean-Louis, 3,946,224.
Visser, Peter J., to Clark Equipment Company. Load engaging and supporting mechanism. 3,945,673, Cl. 294-67.0DA.
Vital Signs, Incorporated: *See—*
Fay, James P., 3,946,159.
Vlemmings, Jan; and Dworak, Wilhelm, to Robert Bosch GmbH. Bearings for the trunnions of gears in gear pumps or the like. 3,945,779, Cl. 418-206.000.
Voegeli, H. Carl. Coin-receiving mechanism for vending machines. 3,945,228, Cl. 70-80.000.
Vogler, Hans Jurgen: *See—*
Poque, Dionysius Josef; Senger, Gerhard Franz-Josef; and Vogler, Hans Jurgen, 3,945,421.
Vogt, B. Richard: *See—*
Wade, Peter C.; and Vogt, B. Richard, 3,946,010.
Voitik, Robert M., to Innovatex Corporation. Lip seal assembly. 3,945,650, Cl. 277-165.000.
Vornberger, Walter, to International Shoe Machine Corporation. Cement lasting the side and heel portions of a shoe assembly. 3,945,075, Cl. 12-145.000.
Vosganiantz, Jean-Jacques, to Universal Oil Products Company. Solid perfumed compositions of matter. 3,945,950, Cl. 252-522.000.
Voss, Andrew P.: *See—*
Yoo, Jin Sun; and Voss, Andrew P., 3,945,914.
Votta, Gerald A.; and Kucharski, Leonard J., to I-T-E Imperial Corporation. Downstream injection nozzle for puffer circuit interrupter. 3,946,180, Cl. 200-148.00A.
Vuaille, Andre, to Sigma Diesel. Hydraulic heads for injection pumps and the injection pumps themselves. 3,945,773, Cl. 417-494.000.
W. R. Grace & Co.: *See—*
Bleyle, Merrill; DelVecchio, William D.; and Trofimow, Alex, 3,946,139.
Morgan, Charles R., 3,945,982.
Wachsmann, Hubert: *See—*
Wurmli, Albert; and Wachsmann, Hubert, 3,945,792.
Waddoups, Max E., Jr.: *See—*
Eisenmann, James R.; Kaminski, Ben E.; and Waddoups, Max E., Jr., 3,946,127.
Wade, Peter C.; and Vogt, B. Richard, to E. R. Squibb & Sons, Inc. 3-Phenyl-2,5-dihydro-as-triazin-6 (1H)-ones. 3,946,010, Cl. 260-248.0AS.
Wadensten, Theodore S. Vibrating table with dual plate top. 3,945,246, Cl. 73-71.600.
Waeldner, William J.: *See—*
Lynch, John F.; and Waeldner, William J., 3,945,565.
Wagner Electric Corporation: *See—*
Fitzgerald, James J., 3,945,707.
Wago-Kontakttechnik GmbH: *See—*
Hohorst, Wolfgang; and Koellmann, Hans-Josef, 3,945,711.
Wahlqvist, Hans Sigvard, to Saab-Scania Aktiebolag, Sodertalje. Decomposable passage-way forming core. 3,945,429, Cl. 164-369.000.
Wahode, Peter: *See—*
Stehle, Heinz; Assmann, Helmut; Wahode, Peter; and Janson, Walter, 3,945,245.
Wakashima, Yoshiaki: *See—*
Iwasawa, Hideo; Wakashima, Yoshiaki; and Inayoshi, Hideo, 3,946,427.
Walchek, Ronald J., to Concrete Pipe Machinery Company. Cap rest assembly for packerhead/vibration system concrete pipe machine. 3,945,787, Cl. 425-262.000.
Waldrop, Jerald Lee: *See—*
Solie, James C.; Doss, Daniel L.; and Waldrop, Jerald Lee, 3,945,610.
Wales, John: *See—*
Cook, John Hayward; and Wales, John, 3,945,723.
Walker, Alexander D. R.: *See—*
Rode, France; Crowley, William L., Jr.; Walker, Alexander D. R.; and Cochran, David S., 3,946,218.
Walker, Andrew; Long, Charles Frederick; and Birks, Harry Davies, to Kaiser Steel Corporation. Splash can for ingot molds and methods. 3,945,426, Cl. 164-137.000.
Walker, Charles W.; and Larson, Larry K. Bicycle frame toolbox. 3,945,544, Cl. 224-32.00R.
Walker, Ronald J.: *See—*
Higbee, Wallace C.; Jensen, Jay W.; and Walker, Ronald J., 3,945,586.
Wallace Murray Corporation: *See—*
Bremer, Robert C., Jr., 3,945,269.
Walter, Arthur A. W., to Erwin Sick Optik-Electronik. Reflector for photoelectronic equipment. 3,945,714, Cl. 350-103.000.
Walz, Duane D., to Energy Research & Generation, Inc. Reticulated foam structure. 3,946,039, Cl. 264-332.000.
Wander Ltd.: *See—*
Vincent, William; and Zeller, Hartmut, 3,946,120.
Ward, John W., to Union Oil Company of California. Zeolite containing compositions, catalysts and methods of making. 3,945,943, Cl. 252-455.00Z.
Warner-Lambert Company: *See—*
Brown, Richard E.; and Shavel, John, Jr., 3,946,008.
Warner, Samuel. Terminated wires and method of making the same. 3,946,145, Cl. 174-94.00R.
Warren, Robert G.: *See—*
Henry, Rodney D.; Besser, Paul J.; and Warren, Robert G., 3,946,372.
Wasson, Burton Kendall; and Weinstock, Leonard M., to Merck Sharp & Dohme (I.A.) Corporation. 2-(3-Substituted amino-2-hydroxypropoxy)-3-substituted pyrazines. 3,946,009, Cl. 260-247.50D.

Watanabe, Katami: *See—*
Sugiyama, Noboru; Suzuki, Masamichi; Watanabe, Katami; Sugiyama, Keiichi; Tadenuma, Hachiro; Kato, Takashi; Kaneda, Ryoji; and Yoshino, Makoto, 3,945,930.

Watanabe, Yoshiaki: *See—*
Mizutani, Yukio; Izumi, Yusuke; and Watanabe, Yoshiaki, 3,946,079.

Waters, Robert S.; and Rogers, Meyric K., to Schick Incorporated. Hair curling appliance. 3,946,196, Cl. 219-222.000.

Wavin B.V.: *See—*
den Hertog, Willem Cornelis; and Rolleman, Geert, 3,945,621.

Wean United Inc.: *See—*
Ledebur, Harry C., 3,945,547.

Weatherhead Company, The: *See—*
Orzel, Edward S., 3,945,686.

Weatherhead, Roger G.: *See—*
Harrison, Tony; and Weatherhead, Roger G., 3,945,971.

Weaver, Merle L.; Hautala, Earl; and Nonaka, Masahide, to United States of America, Agriculture. Preformed potato products. 3,946,116, Cl. 426-103.000.

Weber, Klaus; and Hell, August, to Agfa-Gevaert AG. Carrier for film cartridges or the like. 3,945,494, Cl. 206-389.000.

Weber, Larry F.: *See—*
Johnson, Roger L.; and Weber, Larry F., 3,946,381.

Wedemeyer, Karl-Friedrich; and Imre, Laszlo, to Bayer Aktiengesellschaft. Oxidative splitting of unsaturated hydrocarbons. 3,946,081, Cl. 260-597.00R.

Wedgtrac Corporation: *See—*
Nelson, Bertel S.; and Nelson, Woodrow D., 3,945,270.

Weems, Sterling J., to MPR Associates, Inc. Handling system for nuclear fuel casks. 3,945,509, Cl. 214-16.00B.

Wegner, Hans-Georg: *See—*
Kunert, Maximilian; and Wegner, Hans-Georg, 3,945,912.

Weiler, Raywood C. Means for detachably securing a plurality of supporting legs to a horizontal member to support same. 3,945,740, Cl. 403-2[7.000.

Weinstein, David Harold; Ashworth, Monroe Alfred, III; and Mallett, A. J., to Superior Oil Company, The. Method and apparatus for seismic geophysical exploration. 3,946,357, Cl. 340-15.5TS.

Weinstock, Leonard M.: *See—*
Wasson, Burton Kendall; and Weinstock, Leonard M., 3,946,009.

Weiss, Hubert Leger; and Dinkel, Ernest Josef, to American Construction Equipment Co., Inc. Wiring integrity system. 3,946,282, Cl. 317-48.000.

Weiss, Mitchell, to Hughes Aircraft Company. Dynamic vertical angle sensor. 3,945,128, Cl. 33-366.000.

Weist, Walter Robert: *See—*
Bishop, Marion M.; and Weist, Walter Robert, 3,946,375.

Weldwood of Canada Limited: *See—*
Mouat, Thomas W.; and LeMasurier, Philip Howard, 3,945,125.

Welker, Robert H. High pressure pump. 3,945,770, Cl. 417-401.000.

Welter, Leonard M., to American Optical Corporation. Field emission gun improvement. 3,946,268, Cl. 315-31.00R.

Wendt, Alan C., to United States Gypsum Company. Clip for the assembly of composite structural members. 3,945,167, Cl. 52-714.000.

Wendt, Alan C., to United States Gypsum Company. Self-aligning hanger attachment bracket for structural steel joists. 3,945,741, Cl. 403-232.000.

Wentink, William Stewart: *See—*
Castrodale, Daniel Owen; Steele, Steven Gary; Wentink, William Stewart; and Wheeler, Stephen Edward, 3,946,439.

Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See—*
Mayer, Cornelius; Diewald, Gunther; and Reber, Heinrich, 3,945,321.

Werner, John D. Sync contact switch for movie camera. 3,945,718, Cl. 352-12.000.

Wersi-electronic GmbH & Co. KG: *See—*
Dittmar, Wilfried, 3,945,290.

Wertlake, Paul T.; and Harrison, James S., to Applied Bioscience. Freeze storage container system. 3,945,523, Cl. 215-1.00R.

West, Harry E. Wire bond integrity tester. 3,945,248, Cl. 73-88.00B.

West, James Edward: *See—*
Schonhorn, Harold; Sessler, Gerhard Martin; and West, James Edward, 3,945,112.

Westall, Edward B., to Nutrilite Products, Inc. Insecticidal composition of bacillus thuringiensis admixed with pyrethrum. 3,946,107, Cl. 424-93.000.

Westaway, Thomas A., to United States of America, Navy. Missile guidance by radar signals using surface acoustic wave correlator. 3,946,384, Cl. 343-7.0ED.

Westberg, Walter M., to Minnesota Mining and Manufacturing Company. Laminated photographic film cleaning fabric. 3,945,079, Cl. 15-100.000.

Western Rock Bit Company Limited: *See—*
White, Kenneth M., 3,945,681.

Westgarth, David James: *See—*
Oxlade, Roy Ronald; and Westgarth, David James, 3,945,235.

Westinghouse Air Brake Company: *See—*
Hufnagel, Andrew, 3,946,278.

Westinghouse Electric Corporation: *See—*
Lee, Richard M., 3,945,758.
Milianowicz, Stanislaw A., 3,946,183.
Miller, Klaus, 3,945,760.

Westrom, Arthur C., to Kearney-National Inc. Electric connector apparatus and method. 3,945,699, Cl. 339-12.00R.

Westvaco Corporation: *See—*
Foster, Peter D., 3,945,917.

Westwood, Walter; and Payne, John Blunden, to Johnson, Matthey & Co., Limited. Catalyst and the process for preparing it. 3,945,948, Cl. 252-472.000.

Wetzels, Walter; and Greven, Johann, to Schumag Schumacher Metallwerke GmbH. Parting tool for severing traveling elongated material into predetermined lengths. 3,945,284, Cl. 83-290.000.

Wheelabrator-Frye, Inc.: *See—*
Leliaert, Raymond M., 3,945,155.

Wheeler, Raymond L.: *See—*
Ochs, Gordon M.; and Wheeler, Raymond L., 3,945,583.

Wheeler, Stephen Edward: *See—*
Castrodale, Daniel Owen; Steele, Steven Gary; Wentink, William Stewart; and Wheeler, Stephen Edward, 3,946,439.

Whirlpool Corporation: *See—*
Bashark, Larry T., 3,945,217.

White, Edward L.: *See—*
Schwarcz, Joseph; Engelbart, Bernard; and White, Edward L., 3,945,974.

White, James F.: *See—*
Farona, Michael F.; and White, James F., 3,946,072.

White, James V., to CBS Inc. Apparatus for embossing information on a disc. 3,946,149, Cl. 178-6.60B.

White, Kenneth M., to Western Rock Bit Company Limited. Cutter assembly. 3,945,681, Cl. 299-86.000.

White-Westinghouse Corporation: *See—*
Hetrick, George L., 3,946,201.

Whiting, Roy M.; Soth, Henry J.; and Ragard, Phillip A., to Universal Instruments Corporation. Axial lead component preforming and insertion apparatus. 3,945,100, Cl. 29-33.00M.

Whitman, Robert E., to United States of America, Army. Electrically short transmission line antenna. 3,946,392, Cl. 343-830.000.

Whitsel, Dominick A.: *See—*
McMullen, Galen B., 3,945,654.

Whitten, George R., Jr. Swimming pool inlet fitting assembly. 3,945,061, Cl. 4-172.170.

Widmer, Dieter, to Spindel-Motoren- Und Maschinenfabrik A.G. Textile spindle. 3,945,187, Cl. 57-135.000.

Wiegman, William B.: *See—*
Hecht, Richard M.; and Wiegman, William B., 3,946,203.

Wienen, Walter: *See—*
Boehme, Dietrich; Hahn, Gunter; Schumann, Gunter; Wienen, Walter; and Jung, Rolf, 3,945,279.

Wightman, John Clifford, to D. Ayres Jones & Company Limited. Apparatus for dispensing viscous material. 3,945,538, Cl. 222-333.000.

Wilante, Claude: *See—*
Delaunois, Yvon; Hestermans, Pierre; Leroy, Georges; Peerts, Fernand; and Wilante, Claude, 3,946,083.

Wilhelm Haupt, Firma: *See—*
Altmann, Dieter; and Haupt, Eberhard, 3,945,088.

Wilhelm Quante Spezialmaschinenfabrik fur Apparate der Fernmeldetechnik: *See—*
Quante, Hermann, 3,946,144.

Wilke, Wilbur D.: *See—*
Belshaw, Thomas E.; Woodworth, Fred G.; and Wilke, Wilbur D., 3,945,785.

Wilkerson, Alan W. Geophysical energy source utilization circuit. 3,946,242, Cl. 307-45.000.

Wilkerson Corporation: *See—*
Vander Horst, John; and Dunn, Myron, 3,945,465.

Wilkinson, Alfred, to Sydney S. Bird and Sons Limited. Push-button tuning mechanism. 3,946,344, Cl. 334-7.000.

Willems, Jozef Frans: *See—*
Zorn, Hugo; Kuffner, Karl; Glockner, Hans; Willems, Jozef Frans; and Thiers, Robrecht Julius, 3,945,829.

Willey, Ronald Albert; and Rumpf, Robert John, to Firestone Tire & Rubber Company, The. Saddle pawl and pendulum support for vehicle sensitive inertial retractors. 3,945,587, Cl. 242-107.40A.

Williams, David Godfrey, to C.E.S. (Grinding Machines) Limited. Grinding machine with tilted conveyor and conveyor clearing means. 3,945,153, Cl. 51-110.000.

Williams, Henry J. Time card computer. 3,946,207, Cl. 235-88.00M.

Williams, Stanley Austen. Electrode water heating boiler. 3,946,197, Cl. 219-290.000.

Willis Brothers, Inc.: *See—*
Willis, Elmer D., 3,945,084.

Willis, Elmer D., to Willis Brothers, Inc. Scallop spreading device. 3,945,084, Cl. 17-73.000.

Wilson, Clyde H.; Cross, Donald M.; Dupuy, James A.; and Tarrant, Duel J., to Marathon-LeTourneau Company. Apparatus and method for rendering an offshore drilling platform self mobile. 3,945,450, Cl. 180-8.00R.

Wilson, Donald C., to FMC Corporation. Method of and apparatus for assorting particles according to the physical characteristics thereof. 3,945,915, Cl. 209-12.000.

Wilson, William F.; Chadwick, James R.; and Helmuth, James G., to Chadwick-Helmuth Company, Inc. Helicopter rotor balancing apparatus and method. 3,945,256, Cl. 73-455.000.

Windmoller & Holscher: *See—*
Brockmuller, Friedrich Franz, 3,945,562.

Wingaersheek, Inc.: *See—*
Wormser, Alex F.; and Perkins, Stephen P., 3,945,244.

Winn, Martin; Razdan, Raj Kumar; Dalzell, Haldean Cloyce; and Krei, Joyce Ruth, to Sharps Associates. Pharmaceutical compositions containing 1 or 2-mono and dialkyl substituted thienobenzopyrans and pharmacological uses thereof. 3,946,111, Cl. 424-275.000.

Winnebago Industries, Inc.: *See*—
Holland, Ronald E., 3,945,668.

Winsor, Robert Beck, to IEC-Holden Ltd. Nailable hollow structural member. 3,945,164, Cl. 52-377.000.

Winter, Andrew Simpson: *See*—
Houston, John Kenneth; and Winter, Andrew Simpson, 3,946,155.

Winter, Joseph; Pryor, Michael J.; and Setzer, William C., to Swiss Aluminium Limited. Process for obtaining high ductility high strength aluminum base alloys. 3,945,860, Cl. 148-11.50A.

Wirsbinski, James L., to Veda, Inc. Apparatus for injecting material into the soil. 3,945,332, Cl. 111-7.000.

Wise, Cecil S., to Fiber Controls Corporation. Priority interrupt circuit. 3,945,683, Cl. 302-28.000.

Wisner, Daniel A.: *See*—
Beery, Jack; and Wisner, Daniel A., 3,946,285.

Witt, Chester J.: *See*—
Skoli, Sigmund P.; Witt, Chester J.; and Jones, Hartl R., 3,945,411.

Wohlmut, Peter G.; and Neu, Frank D., to Videonics of Hawaii, Inc. Three dimensional electro-optical retrieval system. 3,946,367, Cl. 340-173.0LM.

Wolber, Robert, to Gebruder Junghans GmbH. Gear enclosure for clocks. 3,945,192, Cl. 58-7.000.

Wolf, Karl: *See*—
Egelhof, Dieter; and Wolf, Karl, 3,945,882.

Wolf, Warren W.: *See*—
Erickson, Thomas D.; and Wolf, Warren W., 3,945,838.

Wolff Walsrode AG: *See*—
Hoppe, Lutz; and Behn, Rudolf, 3,945,983.

Wolfrum, Gerhard: *See*—
Sommer, Richard; and Wolfrum, Gerhard, 3,945,992.

Wolk, Charles M., to E-Z Manufacturing Company. Tire repair tool. 3,945,273, Cl. 81-15.700.

Wolsing, Wilhelm: *See*—
Musall, Reimar; Wolsing, Wilhelm; and Almeroth, Klaus, 3,945,803.

Wong, Ngew-Yee. Impact braking device. 3,945,672, Cl. 293-5.000.

Wood, John R.; Morris, James B., Sr.; and Massoletti, Arnold M., to American Microsystems, Inc. Universal solid state time-keeping package. 3,945,196, Cl. 58-50.00R.

Woodbridge, Richard C. Self capping liquid applicators. 3,945,734, Cl. 401-198.000.

Woodworth, Fred G.: *See*—
Belshaw, Thomas E.; Woodworth, Fred G.; and Wilke, Wilbur D., 3,945,785.

Woosley, Vernon Earl: *See*—
Nagler, William M.; and Woosley, Vernon Earl, 3,945,163.

Wormser, Alex F.; and Perkins, Stephen P., to Wingaersheek, Inc. Flame type halogen leak detector. 3,945,244, Cl. 73-40.700.

Wossidlo, Karl H., to Zenith Radio Corporation. Tracking arrangement. 3,946,166, Cl. 179-100.30V.

Wright, Andrew Charles Walden, to Girling Limited. Abutment assembly for shoe drum brakes. 3,945,261, Cl. 74-110.000.

Wright, Charles H. Rotary engine and turbine assembly. 3,945,200, Cl. 60-624.000.

Wright, George C., to Morton-Norwich Products, Inc. 3-Diethylamino-2,2-dimethylpropyl cinnamates. 3,946,042, Cl. 260-340.500.

Wright, Lawrence A., to Fruehauf Corporation. Anti-sway system for a spreader suspended from a crane. 3,945,504, Cl. 212-14.000.

Wu, Yao Hua; and Lobeck, Walter G., Jr., to Mead Johnson & Company. Phenothiazines, phenoxazines and acridan bis-pyrrolinyl derivatives. 3,946,004, Cl. 260-243.00A.

Wueger, Karl W., to Crompton & Knowles Corporation. Leno selvedge device and method of forming a leno selvedge. 3,945,406, Cl. 139-54.000.

Wuetig, Ralph T., to Signode Corporation. Electric nameplate marker. 3,945,479, Cl. 197-6.500.

Wulfekotter, Dudley: *See*—
Power, George Edward; and Wulfekotter, Dudley, 3,946,137.

Wulfing, Johann A.: *See*—
Tauscher, Manfred; Goring, Joachim; Busch, Wolfgang; and Rohte, Oskar, 3,946,013.

Wurmli, Albert; and Wachsmann, Hubert, to Ciba-Geigy Corporation. Process for the filling of leather and compositions therefor. 3,945,792, Cl. 8-94.210.

Wyatt, Wade Arthur: *See*—
Hastings, Garth Winton; and Wyatt, Wade Arthur, 3,945,964.

Wynkoop, Raymond: *See*—
Shang, Jer-Yu; and Wynkoop, Raymond, 3,945,804.

Xerox Corporation: *See*—
Balandis, Leo Steven, 3,945,546.
Cook, John Hayward; and Wales, John, 3,945,723.
Crandell, Melvin G., 3,945,728.
Drummond, Arthur, Jr., 3,945,342.
Grafton, David, 3,946,150.
Jackson, Earl V., 3,945,724.
Kermisch, Dorian, 3,946,433.
Kockler, Barry C.; Johnson, Robert A.; and Leinberger, Merton C., 3,945,636.
Parent, Richard A.; and Thomas, H. Ronald, 3,945,823.
Sullivan, William A., Jr.; and Eichorn, Roger H., deceased, 3,946,230.
Swanberg, Melvin E., 3,946,222.
Young, Eugene F., 3,946,401.

Yagi, Hajime; Saito, Yoshihiro; and Hirano, Koji, to Sony Corporation. Electret transducer having an electret of inorganic insulating material. 3,946,422, Cl. 357-26.000.

Yagi, Motoi; Akino, Morio; and Takeuchi, Hisaharu, to Tokyo Shibaura Electric Co., Ltd. Cassette tape. 3,945,582, Cl. 242-55.19A.

Yale, Harry Louis; and Petigara, Ramesh B., to E. R. Squibb & Sons, Inc. Process for preparing 6H-pyrido[1,2-c][1,3,5]benzothiadiazepines and benzooxadiazepines and derivatives. 3,946,025, Cl. 260-294.80B.

Yamada, Hiroshi: *See*—
Doi, Yoshikazu; Kishikawa, Toshiro; and Yamada, Hiroshi, 3,945,713.

Yamada, Hirotada; Tobiki, Hisao; Nakatsuka, Iwao; Tanno, Norithiko; Shimago, Kozo; and Nakagome, Takenari, to Sumitomo Chemical Company, Limited. D-α-(4-hydroxypyridine-3-carbonamido)-p-hydroxyphenylacetamidopenicillanic acid. 3,945,995, Cl. 260-239.100.

Yamada, Masaaki: *See*—
Mima, Yasuhiro; and Yamada, Masaaki, 3,945,889.

Yamada, Shozo: *See*—
Yamamatsu, Kenichi; Yamada, Shozo; Nouni, Hiroaki; and Yokoyama, Shuzi, 3,945,404.

Yamada, Takashi: *See*—
Oishi, Kazuo; Yamada, Takashi; and Matsui, Takeshi, 3,945,459.

Yamada, Toshio: *See*—
Sato, Tutomu; Horikawa, Kiyomi; Hiroi, Masayoshi; Umino, Shigeyuki; Yamada, Toshio; Takayama, Takashi; and Kayamori, Toru, 3,945,551.

Yamaguchi, Yozo: *See*—
Murase, Genyo; Mineda, Hisahal; and Yamaguchi, Yozo, 3,945,662.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Kinoshita, Isao; Nagara, Tosio; and Kaziwara, Tosiro, 3,945,454.
Okano, Ryozo; and Tominaga, Nobuyoshi, 3,945,463.
Tilkens, Lucien, 3,945,626.

Yamamatsu, Kenichi; Yamada, Shozo; Nouni, Hiroaki; and Yokoyama, Shuzi, to Towa Kako Co., Ltd. Meat casing with internal release coating. 3,945,404, Cl. 138-118.100.

Yamamoto, Michiaki: *See*—
Sakai, Toshiyuki; Miyazaki, Kazuhide; and Yamamoto, Michiaki, 3,945,947.

Yamamoto, Nobuo: *See*—
Sakai, Tadao; Kawai, Masayoshi; Yamamoto, Nobuo; and Yoneyama, Masakazu, 3,945,824.

Yamamoto, Shigehiko: *See*—
Fukuhara, Satoru; Yamamoto, Shigehiko; and Okano, Hiroshi, 3,945,698.

Yamamoto, Takahiro: *See*—
Miura, Taro; and Yamamoto, Takahiro, 3,946,308.

Yamauchi, Teruo: *See*—
Hosoda, Kiyoshi; Yamauchi, Teruo; and Kobayashi, Masaru, 3,945,166.

Yamazaki, Chikayasu; Nakayama, Takao; and Kawabe, Noriyuki, to Toray Industries, Inc. Process and apparatus for measuring uniformity of physical properties of yarn. 3,945,181, Cl. 57-34.00R.

Yamazaki, Yoshio: *See*—
Takahashi, Takeshi; Kawahara, Kenji; Takahashi, Toshiyuki; Kato, Koichi; and Yamazaki, Yoshio, 3,945,888.

Yanabu, Satoru: *See*—
Murano, Minoru; Yanabu, Satoru; Tamagawa, Toru; Takahashi, Nobuyuki; Okumura, Hiroyuki; and Ohhashi, Hiroshi, 3,946,179.

Yanagawa, Itiro: *See*—
Masuda, Naosuke; and Yanagawa, Itiro, 3,945,689.
Masuda, Naosuke; Yanagawa, Itiro; and Suzuki, Isao, 3,945,690.

Yanagisawa, Ikuo; and Kawai, Toshiyuki, to Nippon Light Metal Research Laboratory Ltd. Die assembly for squeeze casting of metals. 3,945,428, Cl. 164-319.000.

Yanagisawa, Takeshi, to Kabushiki Kaisha Seikosha. Device for striking a bell. 3,945,340, Cl. 116-157.000.

Yanovsky, Jury Grigorievich: *See*—
Ulyanov, Lev Petrovich; Borisenkov, Oleg Nikolaevich; Kastorskaya, Natalya Nikolaevna; Vinogradov, Georgy Vladimirovich; Yanovsky, Jury Grigorievich; and Sergeenkov, Sergei Ivanovich, 3,945,242.

Yariv, Amnon: *See*—
Hunsperger, Robert G.; Stoll, Harold M.; Tangonan, Gregory L.; and Yariv, Amnon, 3,945,110.

Yascheritsyn, Petr Ivanovich; Golant, Jury Khonanovich; Leushkin, Vadim Nikolaevich; Mironov, Gennady Mikhailovich; Minakov, Anatoly Petrovich; and Bogachev, Viktor Vladimirovich. Pulse impact tool for finishing internal surfaces of revolution in blanks. 3,945,098, Cl. 29-90.00R.

Yasuda, Masahito, to Matsushita Electric Industrial Company, Limited. Solid organic semiconductor electrolyte capacitor having a copolymer binder. 3,946,289, Cl. 317-230.000.

Yasuda, Tetsuya: *See*—
Kimura, Satoshi; Mochizuki, Yoshifumi; and Yasuda, Tetsuya, 3,945,190.

Yasuda, Tetuya; and Iinuma, Yoshio, to Citizen Watch Co., Ltd. Battery holder. 3,945,193, Cl. 58-23.0BA.

Yasunari, Kenjiro: *See*—
Shoji, Senji; Yasunari, Kenjiro; and Kosa, Yasunobu, 3,946,425.

Yatsunami, Kazuharu; Miyakado, Satoru; Shiohara, Katsuaki; and Honda, Akira, to Nippon Kokan Kabushiki Kaisha. Method for the collection of dust of a high zinc content during the production of reduced iron pellets. 3,945,817, Cl. 75-5.000.

Yazawa, Kenichiro; Kishimoto, Shinzo; Miyano, Shizuo; and Kondo, Asaji, to Fuji Photo Film Co., Ltd. Dry pre-sensitized azide and silicone rubber containing planographic plates and methods of preparation. 3,945,830, Cl. 96-75.000.

Yellin, Bernard. Means for converting an open-shelved unit or etagere to a closed cabinet with slidable drawers. 3,945,696, Cl. 312-257.00R.

Yokoyama, Shuzi: *See—*
Yamamatsu, Kenichi; Yamada, Shozo; Nouni, Hiroaki; and Yokoyama, Shuzi, 3,945,404.

Yoneda, Takao: *See—*
Nakao, Hisaji; Fukuma, Nobuo; Matsubara, Hideyuki; Takasu, Tadahiro; and Yoneda, Takao, 3,946,212.

Yoneyama, Masakazu: *See—*
Sakai, Tadao; Kawai, Masayoshi; Yamamoto, Nobuo; and Yoneyama, Masakazu, 3,945,824.

Yonezu, Hiroo; and Yuasa, Tonao, to Nippon Electric Company, Limited. Injection semiconductor laser device. 3,946,334, Cl. 331-94.50H.

Yonko, Jon D.: *See—*
Hoagland, John C.; Rutkowski, Robert; and Yonko, Jon D., 3,945,682.

Yoo, Jin Sun; and Voss, Andrew P., to Atlantic Richfield Company. Process for "sulfur reduction of an oxidized hydrocarbon by forming a metal-sulfur-containing compound". 3,945,914, Cl. 208-208.00R.

Yoshida Kogyo Kabushiki Kaisha: *See—*
Fujisaki, Yoshinori; and Shigeno, Shunichi, 3,945,103.
Fukuroi, Takeo, 3,945,090.
Takamatsu, Ikuo, 3,945,405.

Yoshida, Shigeru: *See—*
Taniguchi, Tadasu; Hosaka, Iwao; and Yoshida, Shigeru, 3,946,202.
Taniguchi, Tadasu; Hosaka, Iwao; and Yoshida, Shigeru, 3,946,204.

Yoshimoto, Akira: *See—*
Nakashiki, Koso; Yoshimoto, Akira; and Osaki, Kazuhiko, 3,945,735.

Yoshino, Makoto: *See—*
Sugiyama, Noboru; Suzuki, Masamichi; Watanabe, Katami; Sugiyama, Keiichi; Tadenuma, Hachiro; Kato, Takashi; Kaneda, Ryoji; and Yoshino, Makoto, 3,945,930.

Yoshioka, Tsunehiko; Oyamada, Yasutaka; Iwaya, Shoichi; and Sato, Minoru, to TDK Electronics Co. Ltd. High tension ceramic condenser. 3,946,290, Cl. 317-258.000.

Yoshioka, Yoshio; and Tsukushi, Masanori, to Hitachi, Ltd. Circuit breaker. 3,946,184, Cl. 200-148.00D.

Yost, Russell R., Jr.: *See—*
Cuckler, Virgil A.; and Yost, Russell R., Jr., 3,946,391.

Young, David J., to Eastman Kodak Company. Formaldehyde test element and method of use. 3,945,798, Cl. 23-230.00R.

Young, Eugene F., to Xerox Corporation. Electrothermographic image producing techniques. 3,946,401, Cl. 346-74.0ES.

Young, Robert A. Helium resonance lamp and a leak detection system using the lamp. 3,946,235, Cl. 250-373.000.

Young, Robert A. Low power sealed optically thin resonance lamp. 3,946,272, Cl. 315-267.000.

Yuasa, Tonao: *See—*
Yonezu, Hiroo; and Yuasa, Tonao, 3,946,334.

Yujiro, Ando: *See—*
Moriyama, Inao; Tanaka, Keiji; Yujiro, Ando; and Ohara, Katsunobu, 3,945,725.

Yukie, Takeo: *See—*
Inoue, Yoshimi; and Yukie, Takeo, 3,945,788.

Yurcheshen, Michael: *See—*
Levine, Morris; Yurcheshen, Michael; and Hight, Roland W., 3,945,963.

Zakharova, Nina Vasilievna: *See—*
Gershanov, Felix Borisovich; Liakumovich, Alexandr Grigorievich; Michurov, Jury Ivanovich; Pantukh, Boris Izrailevich; Rutman, Grigory Iosifovich; Sobolev, Valerian Mikhailovich; Grinberg, Alexandr Afroimovich; Gurvich, Yakov Abramovich; Zakharova, Nina Vasilievna; and Nafikova, Almira Mudarisovna, 3,946,086.

Zalewski, Michel. Structure for folding shopping carts, laundry carts and the like. 3,945,660, Cl. 280-42.000.

Zapf, Donald C.: *See—*
Carlson, Bertil V.; and Zapf, Donald C., 3,945,322.

Zaretsky, Joseph, to A. B. Dick Company. Charge compensation network for ink jet printer. 3,946,399, Cl. 346-1.000.

Zehnder, Jurg, to Swiss Aluminium Ltd. Railway bogie. 3,945,325, Cl. 105-167.000.

Zeller, Hartmut: *See—*
Vincent, William; and Zeller, Hartmut, 3,946,120.

Zemek, Albert W.; Orzelek, Frank Joseph; and Ziemba, Mike L., to Universal Instruments Corporation. Axial lead dispenser head. 3,945,283, Cl. 83-278.000.

Zenith Radio Corporation: *See—*
Ma, John; and Tanaka, Akio, 3,946,319.
Skerlos, Peter Constantine, 3,946,148.
van Berkum, Petrus A., 3,945,191.
Wossidlo, Karl H., 3,946,166.

Zetting, Alois, to Cerberus AG. Method and apparatus to monitor conduction of sonic waves in an acoustically conductive medium. 3,946,377, Cl. 340-274.00R.

Zhuchkov, Ivan Ilich: *See—*
Derevyankin, Nikolai Efimovich; Evseev, Vladimir Ivanovich; Zhuchkov, Ivan Ilich; Samoilov, Oleg Borisovich; and Ovechkin, Alexandr Vasilievich, 3,945,886.

Zickos, William T. Drum construction. 3,945,291, Cl. 84-421.000.

Zieber, George M., Jr.: *See—*
Ion, John C.; and Zieber, George M., Jr., 3,945,268.

Ziemba, Mike L.: *See—*
Zemek, Albert W.; Orzelek, Frank Joseph; and Ziemba, Mike L., 3,945,283.

Zimmern, Bernard. Compressors and expansion machines of the single worm type. 3,945,778, Cl. 418-195.000.

Zodrow, Bernhard; Kovacev, Milan; Stengritt, Wolf Dietrich; and Hopp, Rudolf, to G. Schwartz & Co. Lubricating device for roll spindles. 3,945,466, Cl. 184-7.00A.

Zondler, Helmut, to Ciba-Geigy Corporation. ω,ω'-Bis-[4-amino-3-aminomethyl-piperidyl-(1)]-alkanes, process for their manufacture and their use. 3,945,953, Cl. 260-2.00N.

Zorn, Hugo; Kuffner, Karl; Glockner, Hans; Willems, Jozef Frans; and Thiers, Robrecht Julius, to Agfa-Gevaert Aktiengesellschaft. Color photographic multilayer material with improved color density. 3,945,829, Cl. 96-74.000.

Zuev, Viktor Konstantinovich: *See—*
Fedorov, Svyatoslav Nikolaevich; and Zuev, Viktor Konstantinovich, 3,945,054.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF MARCH, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Beecham Group Limited: *See*—
Long, Anthony Alfred Walter; and Nayler, John Herbert Charles, Re. 28,744.

Bishop, Arthur E. Rack and pinion variable ratio steering gear. Re. 28,740, Cl. 74-422.000.

Carson Manufacturing Company, Inc.: *See*—
Smith, Gerald D., Re. 28,745.

Consiglio Nazionale Della Ricerche: *See*—
De Rossi, Mario, Re. 28,743.

Delli-Gatti, Frank A., Jr., to Lee-Norse Company. Mining machine gatherer with fence and arcuate disc vanes. Re. 28,741, Cl. 299-68.000.

De Rossi, Mario, to Consiglio Nazionale Della Ricerche. Storage batteries containing zinc halide in an aqueous solution of the type having a soluble cathode and a dissolved anode. Re. 28,743, Cl. 136-22.000.

Kletschka, Harold D.: *See*—
Rafferty, Edson Howard; and Kletschka, Harold D., Re. 28,742.

Lee-Norse Company: *See*—
Delli-Gatti, Frank A., Jr., Re. 28,741.

Long, Anthony Alfred Walter; and Nayler, John Herbert Charles, to Beecham Group Limited. Crystalline p-hydroxyampicillin and salts thereof. Re. 28,744, Cl. 260-239.100.

Nayler, John Herbert Charles: *See*—
Long, Anthony Alfred Walter; and Nayler, John Herbert Charles, Re. 28,744.

Rafferty, Edson Howard; and Kletschka, Harold D. Pumps capable of use as heart pumps. Re. 28,742, Cl. 415-90.000.

Smith, Gerald D., to Carson Manufacturing Company, Inc. Electronic Siren Circuit. Re. 28,745, Cl. 340-384.00E.

LIST OF PLANT PATENTEES

Arms & Nursery, Inc.: *See*—
Swim, Herbert C., and Ellis. 3,847.

Ellis, Arnold W.: *See*—
Swim, Herbert C., and Ellis. 3,847.

Fischer, Arnold W. African violet named helga. 3,848, 3–23–76, Cl. 69.

Fischer, Arnold W. African violet plant named karla. 3,849, 3–23–76, Cl. 69.

Iwamura, Seishi. Plum plant. 3,850, 3–23–76, Cl. 38.

Kordes, Reimer. Rose plant. 3,850, 3–23–76, Cl. 38.

Swim, Herbert C., and A. W. Ellis, to Arms & Nursery, Inc. Rose plant. 3,847, 3–23–76, Cl. 11.

LIST OF DESIGN PATENTEES

Ahroni, Joseph M. Socket assembly for a miniature decorative light bulb. 239,288, 3–23–76, Cl. D26—1.

Akazawa, Toshimasa, to Matsushita Electric Industrial Co., Ltd. Combined record player receiver and amplifier. 239,323, 3–23–76, Cl. D56—4.

Aktiebolaget Svenska Flaktfabriken: *See*—
Larkfeldt, Birger, and Widerby. 239,285.

American Can Co.: *See*—
Balocca, Alfred E., Hardy,, Hemeyer, and Wilkinson. 239,257.
Brincks, Richard J., Fox, and Holc. 239,254.
Brincks, Richard J., Fox, and Holc. 239,255.
Brincks, Richard J., Fox, and Holc. 239,256.

Amico, Inc.: *See*—
Booty, Donald J. 239,229.

Appleman, Donald T., to Procter & Gamble. Paper toweling. 239,326, 3–23–76, Cl. D59—2.

Artistic Woodwork Co., Ltd.: *See*—
Vihma. Johannes. 239,237.

Asia International: *See*—
Vong Hoi T. 239,324.

Ault, Charles M. Casing for a hand held interactive computer terminal. 239,287 3–23–76. Cl. D26—5.

Authier, Richard, to Paillard S.A. Typewriter. 239,327, 3–23–76, Cl. D64—1.

Baker, Raymond W. Pocketed ball game board or similar article. 239,300, 3–23–76, Cl. D34—5.

Baker, Richard L.: *See*—
Kennedy, Ralph C., and Baker. 239,282.

Balocca, Alfred E., P. W. Hardy, K. P. Hemeyer, and H. E. Wilkinson, to American Can Co. Container end. 239,257. 3–23–76. Cl. D9—253.

Baumer, Allen P. Camper unit for pick-up trucks or the like. 239,269. 3–23–76, Cl. D12—156.

Benway, Joseph T. Combined miniature bar and night lamp. 239,313, 3–23–76, Cl. D48—20.

Berger, Irvin E.: *See*—
Ronvik, John P., and Berger. 239,226.

Berns, Charles, and R. M. Duris, to General Signal Corp. Fire detector. 239,265. 3–23–76, Cl. D10—106.

Blackman, Sol: *See*—
Buday, Eugene, and Blackman, 239,238–41.

Blankenship, Arthur C.: *See*—
Smajd, Carl F., and Blankenship. 239,270.

Boldt, Melvin H., to Zenith Radio Corp. Television receiver. 239,325, 3–23–76. Cl. D56—4.

Bontempi, Paolo. Toy guitar. 239 309, 3–23–76, Cl. D34—15.

Booty, Donald J., to Amico, Inc. Spice chest cabinet. 239,229 3–23–76, Cl. D6—129.

Bottcher, Dallas R. Air brush holder. 239,286, 3–23–76, Cl. D23—167.

Branscum, Tony E., to Gott Mfg. Co., Inc. Insulated food container. 239.249, 3–23–76, Cl. D7—77.

Brincks, Richard J., W. L. Fox, Jr., and H. S. Holc, to American Can Co. Container end. 239,254, 3–23–76, Cl. D9—253.

Brincks, Richard J., W. L. Fox, Jr., and H. S. Holc, to American Can Co. Container end. 239,255, 3–23–76, Cl. D9—253.

Brincks, Richard J., W. L. Fox, Jr., and H. S. Holc, to American Can Co. Container end. 239,256, 3–23–76, Cl. D9—253.

Bromberg, Michael A., to Termiflex Corp. Computer input output lower case alpha type font. 239,328, 3–23–76, Cl. D64—12.

Buday, Eugene, and Sol Blackman. Hot food merchandiser. 239,238, 3–23–76, Cl. D6—172.

Buday, Eugene, and Sol Blackman. Hot beverage merchandiser. 239,239, 3–23–76. Cl. D6—168.

Buday. Eugene, and Sol Blackman. Merchandiser for food and the like. 239,240, 3–23–76. Cl. D6—168.

Buday, Eugene, and Sol Blackman. Combined cold beverage and frozen food merchandiser. 239,241, 3–23–76, Cl. D6—187.

Bufton, Rodney D., by The Lucas Electrical Co. Ltd. Flower pot. 239,308. 3–23–76, Cl. D35—3.

Burchard, Joseph A. Belt. 239,219, 3–23–76, Cl. D2—389.

Campagnolo, Tullio. Wheel for motorcycles. 239,272, 3–23–76, Cl. D12—205.

Campanell, Ronald J., and W. P. Doe, to The Quaker Oats Co. Toy house. 239 305, 3–23–76, Cl. D34—15.

Carroll, John W. III, to Data General Corp. Computer. 239,293, 3–23–76, Cl. D26—5.

Carrousel Party Favors, Inc.: *See*—
Tiep, Joe, D., and H. 239,253.

Catney, Glenn T. Bellows smoking pipe. 239,294, 3–23–76, Cl. D27—3.

Christman, Larry: *See*—
Christman, Roman, L., and R. 239,338.

Christman, Ricky: *See*—
Christman, Roman, L., and R. 239,338.

Christman, Roman, Larry, and Ricky. Two-way fire extinguisher locator sign. 239,338, 3–23–76, Cl. D06—12.

Clarke, Robert, to Paramount Health Equipment Corp. Seated bench exercising machine. 239,301, 3–23–76, Cl. D34—5.

Clark, Robert, to Paramount Health Equipment Corp. Tricep exercising machine. 239,302, 3–23–76, Cl. D34—5.

Clarke, Robert, to Paramount Health Equipment Corp. Vertical butterfly exercising machine. 239,303, 3–23–76, Cl. D34—5.

Clarke, Robert, to Paramount Health Equipment Corp. Leg curl exercising machine. 239,306, 3–23–76, Cl. D34—5.

Cockcroft, Michael D., to Mar-Line Displays, Inc. Cassette display rack. 239,231, 3–23–76, Cl. D6—157.

Cockcroft, Michael D., to Mar-Line Displays, Inc. Cassette display rack. 239,232, 3–23–76. Cl. D6—172.

Cognata, Larry M., to The Murray Ohio Mfg. Co. Cog cover for self-propelled rotary lawnmower. 239,311, 3–23–76, Cl. D40—1.

Coperthwaite, William S. Yurt or similar article. 239,278, 3–23–76, Cl. D13—1.

Costabile Eugene J., to Futorian Corp. Sofa. 239,236, 3–23–76, Cl. D6—61.

Covey, Laird F., and G. W. Merrow, to The Stanley Works. Hacksaw. 239,252, 3–23–76, Cl. D8—96.

Dale, John, Ltd.: *See—*
Gale, Philip D. 239,260.

Data General Corp.: *See—*
Carroll, John W. III. 239,293.

Doe, Walter P.: *See—*
Campanel, Ronald J., and Doe. 239,305.

Dougherty, Earle T. Concrete fence panel. 239,295, 3–23–76, Cl. D28—1.

Doyel, John S. Apparatus for attaching ornaments to sheet material. 239,320, 3–23–76, Cl. D55—1.

Duris, Rudolph M.: *See—*
Berns, Charles, and Duris. 239,265.

Enloe, James L.: *See—*
Hopper, Norman D. 239,318.

Everts, Robert G.: *See—*
Schramm, Buford J., and Everts. 239,329.

Faul, Thomas L. Cleat. 239,258, 3–23–76, Cl. D8—232.

Fink, Morris. Tow line hitch for water ski. 239,275, 3–23–76, Cl. D12—162.

Fletcher, Alfred W., to The Moreton Engineering Co., Ltd. Counter mat. 239,245, 3–23–76, Cl. D7—188.

Forgiarini, Kreso. Building structure. 239,277, 3–23–76, Cl. D13—1.

Foreman, William L. Ring. 239,312, 3–23–76, Cl. D45—10.

Fortson, Willis C. Shield attachable to a helmet. 239,218, 3–23–76, Cl. D2—233.

Fox, William L.: *See—*
Brinks, Richard J., Fox, and Holc. 239,256.

Fratelli Saporiti: *See—*
Introini, Victorio. 239,228.

Fujii, Yuzo: *See—*
Kawata, Yoshiaki, Fujii, Mori, and Tanaka. 239,250.

Futorian Corp.: *See—*
Williams, David P. G. 239,235.
Costabile, Eugene J. 239,236.

GAF Corp.: *See—*
Terwilliger, Bruce. 239,276.

GTE Lenkurt Inc.: *See—*
Stewart, James R. 239,292.

Gale, Philip D., to John Dale, Ltd. Crate for beverage containers or the like. 239,260, 3–23–76, Cl. D9—177.

Gamble, William L., and R. H. Russell, to Industrial Design Consultants. Ski seat. 239,234, 3–23–76, Cl. D6—47.

General Electric Co.: *See—*
Klucznik, Paul J. 239,321.

General Signal Corp.: *See—*
Berns, Charles, and Duris. 239,265.

Gilbert Products, Inc.: *See—*
Lieberman, Gilbert. 239,314.

Gott Mfg. Co., Inc.: *See—*
Branescum, Tony E. 239,249.

Guida, Carol. Combined costumer and accessory holder for a child. 239,224, 3–23–76, Cl. D6—20.

Guinette, Gladys M. Hair gel dispensing comb. 239,333, 3–23–76, Cl. D86—8.

Hachtmann, William, and A. M. Knight, to Arlen M. Knight. Hand tool for cleaning fabric. 239,243, 3–23–76, Cl. D7—161.

Haerr, Raymond H., to Xomox Corp. Autoclavable pick-guard. 239,310, 3–23–76, Cl. D32—1.

Hamada, Masanori, to Matsushita Electric Industrial Co., Ltd. Radio receiver. 239,339, 3–23–76, Cl. D56—4.

Hardy, Paul W.: *See—*
Balocca, Alfred E., Hardy, Hemeyer, and Wilkinson. 239,257.

Harty, Millard F., Jr. Wheel. 239,267, 3–23–76, Cl. D12—209.

Harty, Millard F., Jr., Combined wheel and tire. 239,268, 3–23–76, Cl. D12—135.

Haws Drinking Faucet Co.: *See—*
Haws, Terry R. 239,284.

Haws, Terry R., to Haws Drinking Faucet Co. Pedestal drinking fountain. 239,284, 3–23–76, Cl. D23—13.

Hemeyer, Karl P.: *See—*
Balocca, Alfred E., Hardy, Hemeyer, and Wilkinson. 239,257.

Holc, Henry S.: *See—*
Brincks, Richard J., Fox, and Holc. 239,256.

Hopper, Norman D., to James L. Enloe. Portable drill die holder. 239,318, 3–23–76, Cl. D54—4.

Industrial Design Consultants: *See—*
Gamble, William L., and Russell. 239,234.

Introini, Victorio, to Fratelli Saporiti. Upholstered furniture. 239,228, 3–23–76, Cl. D6—71.

Ishii, Masaaki: *See—*
Satoh, Taiji, and Ishii. 239,315.

Jackson, Albert P. Divot replacement tool. 239,304, 3–23–76, Cl. D34—5.

Johnson, Ernest D., and C. W. Roberts, to Westmont Industries. Pair of balustrades for passenger conveyors. 239,279, 3–23–76, Cl. D13—7.

Johnson, Lewis T., to Phillips Petroleum Co. Bakery tray or the like. 239,335, 3–23–76, Cl. D87—1.

Johnson, Lewis T., to Phillips Petroleum Co. Bakery tray or the like. 239,337, 3–23–76. Cl. D87—1.

Johnston, John P. Coin. 239,296, 3–23–76, Cl. D29—19.

Kapnek, Bertram H. Display case. 239,242, 3–23–76, Cl. D6—168.

Kawata, Yoshiaki, to Matsushita Electric Industrial Co., Ltd. Micro-wave oven. 239,246, 3–23–76, Cl. D7—128.

Kawata, Yoshiaki, Daisaku Mori, Yuzo Fujii, and Michio Tanaka, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 239,250, 3–23–76, Cl. D7—128.

Kendall Co., The: *See—*
Villari, Frank K. 239,283.

Kennedy, Ralph C., and R. L. Baker, to The Leisure Group, Inc. Revolver. 239,282, 3–23–76, Cl. D22—1.

Kim, Kee-Ock, and Hae-Chin Park. Bonnet. 239,216, 3–23–76, Cl. D2—239.

Klucznik, Paul J., to General Electric Co. Portable radio. 239,321, 3–23–76. Cl. D56—4.

Knight, Arlen M.: *See—*
Hachtmann, William, and Knight. 239,243.

Koch, Ulrich H.: *See—*
Matousek, Stephen, and Koch. 239,319.

Kojima, Hisatoshi: *See—*
Saito, Hiroshi, Komija, and Matsushima. 239,290.

Kurozumi, Shigeru, to Sharp Kabushiki Kaisha (Sharp Corp.). Electronic calculating machine. 239,291, 3–23–76, Cl. D26—5.

Larkfeldt, Birger, and Lennart Widerby, to Aktiebolaget Svenska Flaktfabriken. Adjustable air outlet unit. 239,285, 3–23–76, Cl. D23—163.

Lee, Ke W. Combined clockface and hands therefor. 239,263, 3–23–76, Cl. D10—124.

Leisure Group, Inc., The: *See—*
Kennedy, Ralph C., and Baker. 239,282.

Lhoest, Willy, and Eloi Von Hoye, to Recherche et Industrie Therapeutiques. Device for administering a biological product. 239,332, 3–23–76, Cl. D83—12.

Lieberman, Gilbert, to Gilbert Products, Inc. Lamp support. 239,314, 3–23–76, Cl. D48—20.

Lloyd, John D., to Pony Sporting Goods Ltd. Sports footwear article. 239,217, 3–23–76, Cl. D2—310.

Lowenstein, Martin. Holder for graphic designer's tools or the like. 239,334, 3–23–76, Cl. D87—1.

Lubalin, Smith, Carnase, Inc.: *See—*
Lubge, Reiner. 239,244.

Lubge, Reiner, to Lubalin, Smith, Carnase, Inc. Combined spice rack and bottles therefor. 239,244, 3–23–76, Cl. D7—71.

Lucas Electrical Co. Ltd., The: *See—*
Bufton, Rodney D. 239,308.

Mar-Line Displays, Inc.: *See—*
Cockcroft, Michael D. 239,231.
Cockcroft, Michael D. 239,232.

Master Industries, Inc.: *See—*
Norman, Bill. 239,220.

Matousek, Stephen, and U. H. Koch, to Whitey Research Tool Co. Rotary actuator. 239,319, 3–23–76, Cl. D55—1.

Matsushima, Hisatoshi: *See—*
Saito, Hiroshi, Kojima, and Matsushima. 239,290.

Matsushita Electric Industrial Co., Ltd.: *See—*
Akazawa, Toshimasa. 239,323.
Hamada, Masanori. 239,339.
Kawata, Yoshiaki. 239,246.
Kawata, Yoshiaki, Mori, Fujii, and Tanaka. 239,250.
Saito, Hiroshi, Kojima, and Matsushima. 239,290.
Takenaka, Kazumasa. 239,322.

McCain, Lawrence G., and E. W. Scott, to Rockwell International Corp. Thermal printer. 239,289, 3–23–76, Cl. D26—5.

Merrow, George W.: *See—*
Covey, Laird F., and Merrow. 239,252.

Miller, James J. Toaster french fry product. 239,215, 3–23–76, Cl. D1—23.

Ming, Hans-Peter, and E. H. Yonkers, to Sika AG. Bottle or the like. 239,259, 3–23–76, Cl. D9—38.

Moreton Engineering Co., Ltd., The: *See—*
Fletcher, Alfred W. 239,245.

Mori, Daisaku: *See—*
Kawata, Yoshiaki, Mori, Fujii, and Tanaka. 239,250.

Murray Ohio Mfg. Co., The: *See—*
Cognata, Larry D. 239,311.

Norman, Bill, to Master Industries, Inc. Wrist support. 239,220, 3–23–76, Cl. D2—361.

Oneida Ltd.: *See—*
Perry, Frank R. 239,247.

O'Shea, John J. Golf ball putting game target. 239,299, 3–23–76, Cl. D34—5.

Pace Collection, Inc., The: *See—*
Schweitzer, Janet. 239,225.

Paillard S.A.: *See—*
Authier, Richard. 239,327.

Paramount Health Equipment Corp.: *See—*
Clarke, Robert. 239,301.
Clarke, Robert. 239,302.
Clarke, Robert. 239,303.
Clarke, Robert. 239,306.

Park, Hae-Chin: *See—*
Kim, Kee-Ock, and Park. 239,216.

Perry, Frank R., to Oneida Ltd. Spoon or similar article. 239,247, 3–23–76, Cl. D7—137.

Phillips Petroleum Co.: *See—*
Johnson, Lewis T. 239,335.
Johnson, Lewis T. 239,337.

Pinguely, Douglas B. Automobile cuspidor. 239,248, 3–23–76, Cl. D7—190.

Pony Sporting Goods Ltd.: *See—*
Lloyd, John D. 239,217.

Procter & Gamble Co., The: *See—*
Appleman, Donald T. 239,326.

Quaker Oats Co., The: *See—*
Campanell, Ronald J., and Doe. 239,305.

Recherche et Industrie Therapeutiques: *See—*
Lhoest, Willy, and Van Hoye. 239,332.

Richards Mfg. Co., Inc.: *See—*
Shea, John J. 239,330.
Treace, Harry T. 239,331.

Roberts, Charles W.: *See—*
Johnson, Ernest D., and Roberts. 239,279.

Rockwell International Corp.: *See—*
McCain, Lawrence G., and Scott. 239,289.

Ronvik, John P., and I. E. Berger, to Sears, Roebuck & Co. Child carrier for bicycle. 239,226, 3–23–76, Cl. D6—48.

Russell, Richard H.: *See*—
Gamble, William L., and Russell. 239,234.

SCM Corp.: *See*—
Taylor, William E. 239,233.

St. Amand, Elmer F., to Fred A. Stewart, Inc. Flower holder. 239,297, 3–23–76, Cl. D35—3.

Saito, Hiroshi, Kazuyosh Kojima, and Hisatoshi Matsushima, to Matsushita Electric Industrial Co., Ltd. Microphone. 239,290, 3–23–76, Cl. D26—14.

Samsonite Corp.: *See*—
Smith, Dale D. 239,222.
Smith, Dale D. 239,223.

Sanford Research Co.: *See*—
Taylor, Guy A. 239,280.

Sanshin Dengu Mfg. Co., Ltd.: *See*—
Satoh, Taiji, and Ishii. 239,315.

Satoh, Taiji, and Masaaki Ishii, to Sanshin Dengu Mfg. Co., Ltd. Searchlight. 239,315, 3–23–76, Cl. D48—20.

Sawyer, George M. Seed sprouter assembly. 239,307, 3–23–76, Cl. D35—3.

Schramm, Buford J., and R. G. Everts. Internal combustion engine. 239,329, 3–23–76, Cl. D77—1.

Schweitzer, Janet, to The Pace Collection, Inc. Wall system. 239,225, 3–23–76, Cl. D6—127.

Scott, Edward W.: *See*—
McCain, Lawrence G., and Scott. 239,289.

Sears, Roebuck & Co.: *See*—
Ronvik, John P., and Berger. 239,226.

Senger, Gerhard F.-J., to Uniroyal, Inc. Pneumatic tire tread and buttress. 239,273, 3–23–76, Cl. D12—136.

Sharp Kabushiki Kaisha (Sharp Corp.): *See*—
Kurozumi, Shigeru. 239,291.

Shea, John J., Jr., to Richards Mfg. Co., Inc. Ventilation tube for myringotomy operations. 239,330, 3–23–76, Cl. D83—12.

Sheets, James F. Support bracket. 239,251, 3–23–76, Cl. D8—242.

Sika AG: *See*—
Ming, Hans-Peter, and Yonkers. 239,259.

Smajd, Carl F., and A. C. Blankenship, to Uniroyal, Inc. Pneumatic tire tread and buttress. 239,270, 3–23–76, Cl. D12—142.

Smith, Dale D., to Samsonite Corp. Chair. 239,222, 3–23–76, Cl. D6—69.

Smith, Dale D., to Samsonite Corp. Rocking chair. 239,223, 3–23–76, Cl. D6—49.

Smith, Kenneth A. Dispensing tray for plastic bags or the like. 239,316, 3–23–76, Cl. D52—2.

Snyder, Stephen L. Aircraft. 239,274, 3–23–76, Cl. D12—76.

Spencer, Jesse L., Jr., and J. S. Stewart. Wood planer cutter head with removable bits. 239,317, 3–23–76, Cl. D55—1.

Stanley Works, The: *See*—
Covey, Laird F., and Merrow. 239,252.

Stewart, Fred A., Inc.: *See*—
St. Amand, Elmer F. 239,297.

Stewart, James R., to GTE Lenkurt Inc. Housing for data set or similar article. 239,292, 3–23–76, Cl. D26—5.

Stewart, John S.: *See*—
Spencer, Jesse L., Jr., and Stewart. 239,317.

Takenaka, Kazumasa, to Matsushita Electric Industrial Co., Ltd. Radio receiver. 239,322, 3–23–76, Cl. D56—4.

Taylor, Guy A., to Sanford Research Co. Design for a writing pen cap. 239,280, 3–23–76, Cl. D19—57.

Taylor, William E., to SCM Corp. Display rack or the like. 239,233, 3–23–76, Cl. D6—153.

Termiflex Corp.: *See*—
Bromberg, Michael A. 239,328.

Terwilliger, Brue, to GAF Corp. Simulated brick structure or the like. 239,276, 3–23–76, Cl. D13—1.

Tiep, Darin: *See*—
Tiep, Joe, D., and H. 239,253.

Tiep, Herbert: *See*—
Tiep, Joe, D, and H. 239,253.

Tiep, Joe, D., and H., to Carrousel Party Favors, Inc. Packaging container. 239,253, 3–23–76, Cl. D9—191.

Treace, Harry T., to Richards Mfg. Co., Inc. Cast cutter. 239,331, 3–23–76, Cl. D83—12.

Tsuyama Mfg. Co., Ltd.: *See*—
Tsuyama, Yosimasa. 239,266.

Turner, Allen D., to Uniroyal, Inc. Pneumatic tire tread and buttress 239,271, 3–23–76, Cl. D12—146.

Turner, Don L. Finger ring cue chalk holder. 239,298, 3–23–76, Cl. D34—3.

Uniroyal, Inc.: *See*—
Senger, Gerhard F.-J. 239,273.
Smajd, Carl F., and Blankenship. 239,270.
Turner, Allen D. 239,271.

Urie, Albert A. Tape cartridge holder for automobile ceiling. 239,336, 3–23–76, Cl. D87—1.

Van Kersen, Philip L. Thermochromic thermometer. 239,261, 3–23–76, Cl. D10—57.

Van Kersen, Philip L. Thermochromic adhesive thermometer. 239,262, 3–23–76, Cl. D10—57.

Vihma, Johannes, to Artistic Woodwork Co., Ltd. Picture frame moulding. 239,237, 3–23–76, Cl. D6—246.

Villari, Frank K., to The Kendall Co. Valve housing. 239,283, 3–23–76, Cl. D23—19.

Vogt, Franz, to Voko Franz Vogt & Co. Desk. 239,227, 3–23–76, Cl. D6—162.

Voko Franz Vogt & Co.: *See*—
Vogt, Franz. 239,227.

Vong, Hoi T., to Asia International. Wrist radio. 239,324, 3–23–76, Cl. D56—4.

Von Hoye, Eloi: *See*—
Lhoest, Willy. 239,332.

Wasserman, Bernard. Toothbrush. 239,21, 3–23–76, Cl. D4—25.

Wener, Hyman. Child's car seat. 239,230, 3–23–76, Cl. D6—9.

Westmont Industries: *See*—
Johnson, Ernest D., and Roberts. 239,279.

Whitey Research Tool Co.: *See*—
Matousek, Stephen, and Koch. 239,319.

Widerby, Lennart: *See*—
Larkfeldt, Birger, and Widerby. 239,285.

Williams, David P. G., to Futorian Corp. Seat. 239,235, 3–23–76, Cl. D6—63.

Williams, William O., Jr. Plastic artificial fishing lure. 239,281, 3–23–76, Cl. D22—27.

Xomox Corp.: *See*—
Haerr, Raymond H. 239,310.

Yonkers, Edward H.: *See*—
Ming, Hans-Peter, and Yonkers. 239,259.

Zenith Radio Corp.: *See*—
Boldt, Melvin H. 239,325.

CLASSIFICATION OF PATENTS

ISSUED MARCH 23, 1976

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2 3,945,041
3,945,042
8 3,945,043
14H 3,945,044
16 3,945,045
22 3,945,046
24 3,945,047
49R 3,945,048
169 3,945,049
197 3,945,050
224R 3,945,051

CLASS 3

1 3,945,052
1.911 3,945,053
13 3,945,054

CLASS 4

30 3,945,055
67A 3,945,056
67R 3,945,057
163 3,945,058
172 3,945,059
172.17 3,945,061
227 3,945,062
228 3,945,060

CLASS 5

63 3,945,063
181 3,945,064

CLASS 7

14.3 3,945,065

CLASS 8

17 3,945,791
94.21 3,945,792
168A 3,945,793
172R 3,945,794

CLASS 9

8P 3,945,066
14 3,945,067
310J 3,945,068

CLASS 10

1A 3,945,070
7 3,945,071
13 3,945,072
141R 3,945,069

CLASS 11

1A 3,945,073

CLASS 12

52 3,945,074
145 3,945,075

CLASS 15

21R 3,945,076
77 3,945,077
99 3,945,078
100 3,945,079
187 3,945,080
312R 3,945,081

CLASS 17

33 3,945,082
44.2 3,945,083
73 3,945,084

CLASS 19

80R 3,945,085

CLASS 21

61 3,945,795
80 3,945,796

CLASS 23

230PC 3,945,797
3,945,799
230R 3,945,798
232R 3,945,800
254E 3,945,801
277C 3,945,802
288FC 3,945,803
288E 3,945,804
290 3,945,805
3,945,806

CLASS 24

30.5T 3,945,086
73CS 3,945,087
81CC 3,945,088
155SD 3,945,089
205.14R 3,945,090
230A 3,945,091
248L 3,945,092

CLASS 26

68 3,945,093

CLASS 27

11 3,945,094

CLASS 28

76T 3,945,096

CLASS 29

2 3,945,097
25.35 3,945,099
33M 3,945,100
90R 3,945,098
156.8CF 3,945,101
159R 3,945,102
182.3 3,945,807
193.5 3,945,808
207.5SL 3,945,103
255 3,945,104
401F 3,945,105
429 3,945,106
431 3,945,107
450 3,945,108
525 3,945,109
572 3,945,110
577 3,945,347
588 3,945,111
592 3,945,112
625 3,945,113
628 3,945,114

CLASS 30

34.2 3,945,115
206 3,945,116
287 3,945,117
346.51 3,945,118
383 3,945,119
393 3,945,120

CLASS 33

77 3,945,123
147T 3,945,121
169R 3,945,124
174D 3,945,122
174R 3,945,125
179.5R 3,945,126
265 3,945,127
366 3,945,128
399 3,945,129

CLASS 34

10 3,945,130
122 3,945,131

CLASS 35

25 3,945,133
60 3,945,132

CLASS 36

2.5AL 3,945,134
3,945,135
38 3,945,136

CLASS 37

183R 3,945,137
190 3,945,138

CLASS 40

102 3,945,140
125A 3,945,141
130R 3,945,139

CLASS 42

1S 3,945,142

CLASS 43

17 3,945,143
44.6 3,945,145
54.5A 3,945,144

CLASS 46

50 3,945,146
76R 3,945,147

CLASS 47

14 3,945,148

CLASS 48

73 3,945,809
76 3,945,810

CLASS 49

121 3,945,149

CLASS 51

9R 3,945,150
26 3,945,151
110 3,945,153
137 3,945,154
178 3,945,152
319 3,945,155

CLASS 52

2 3,945,156
22 3,945,158
36 3,945,157
66 3,945,159
81 3,945,160
208 3,945,161
219 3,945,163
377 3,945,164
406 3,945,165
520 3,945,166
714 3,945,167
720 3,945,168
741 3,945,169

CLASS 53

21R 3,945,170
79 3,945,171
112A 3,945,172
188 3,945,173
289 3,945,174

CLASS 55

73 3,945,811
97 3,945,812
108 3,945,813

CLASS 56

10.8 3,945,175
11.8 3,945,176
12.7 3,945,177
14.6 3,945,178
28 3,945,179
221 3,945,180

CLASS 57

34R 3,945,181
3,945,183
58.52 3,945,182
58.86 3,945,184
58.95 3,945,185
135 3,945,187
153 3,945,186
156 3,945,188
160 3,945,189

CLASS 58

4A 3,945,190
3,945,191
7 3,945,192
23BA 3,945,193
23R 3,945,194
3,945,195
50R 3,945,196
59 3,945,197

CLASS 59

16 3,945,198

CLASS 60

39.28R 3,945,199
222 3,945,201
253 3,945,202
259 3,945,203
274 3,945,204
289 3,945,205
374 3,945,206
416 3,945,207
420 3,945,208
546 3,945,209
618 3,945,210
624 3,945,200
649 3,945,211

CLASS 61

46.5 3,945,212
69R 3,945,213

CLASS 62

54 3,945,214
55 3,945,215
84 3,945,216
151 3,945,217
260 3,945,218
469 3,945,219
505 3,945,220

CLASS 64

24 3,945,221

CLASS 65

11R 3,945,814
12 3,945,815
22 3,945,816

CLASS 66

1R 3,945,222
50R 3,945,223
56 3,945,224

CLASS 68

5D 3,945,225
23.1 3,945,226

CLASS 70

58 3,945,227
80 3,945,228
363 3,945,229

CLASS 72

30 3,945,230
45 3,945,231
181 3,945,232
3,945,233
235 3,945,234
238 3,945,235
340 3,945,236
402 3,945,237
410 3,945,238
452 3,945,239
462 3,945,240

CLASS 73

7 3,945,241
15.4 3,945,242
17R 3,945,243
40.7 3,945,244
71.4 3,945,245
71.6 3,945,246
73 3,945,247
88B 3,945,248
94 3,945,249
194EM 3,945,250
194F 3,945,251
204 3,945,252
231R 3,945,253
425.6 3,945,254
432R 3,945,255
455 3,945,256

CLASS 74

17.8 3,945,257
29 3,945,258
61 3,945,259
89.17 3,945,260
110 3,945,261
219 3,945,262
231J 3,945,263
242.1A 3,945,264
335 3,945,265
401 3,945,266
422 Re.28,740
501R 3,945,267
3,945,268
574 3,945,269
798 3,945,270

CLASS 75

5 3,945,817
10R 3,945,818
53 3,945,819
60 3,945,820
126C 3,945,821

CLASS 76

25A 3,945,271
107R 3,945,272

CLASS 81

15.7 3,945,273
58.1 3,945,274

CLASS 82

40R 3,945,275
47 3,945,276
51 3,945,277

CLASS 83

12 3,945,278
34 3,945,279
98 3,945,280
100 3,945,281
247 3,945,282
278 3,945,283
290 3,945,284
437 3,945,285
486.1 3,945,286
628 3,945,287
834 3,945,288
853 3,945,289

CLASS 84

1.25 3,945,290
421 3,945,291
484 3,945,292

CLASS 85

49 3,945,293
63 3,945,294

CLASS 89

1.5D 3,945,295
191A 3,945,296

CLASS 90

11C 3,945,297
13.05 3,945,298

CLASS 91

31 3,945,299
173 3,945,300
442 3,945,301

CLASS 92

13.2 3,945,302
58 3,945,303
140 3,945,304

CLASS 93

49R 3,945,305

CLASS 96

1SD 3,945,823
1R 3,945,822
4 3,945,824
27H 3,945,825
36 3,945,826
36.2 3,945,827
66R 3,945,828
74 3,945,829
75 3,945,830
86P 3,945,831
100 3,945,832
115R 3,945,833

CLASS 98

40DL 3,945,306
60 3,945,307
115R 3,945,308

CLASS 99

348 3,945,309
452 3,945,310
483 3,945,311
605 3,945,312

CLASS 100

34 3,945,313
53 3,945,314
95 3,945,315

CLASS 101

45 3,945,316
124 3,945,317
467 3,945,318

CLASS 102

22 3,945,319
27R 3,945,320
67 3,945,321
70R 3,945,322
71 3,945,323
78 3,945,324

CLASS 105

167 3,945,325
215C 3,945,326
224.1 3,945,327

CLASS 106

15R 3,945,834
3,945,835
22 3,945,836
3,945,837
50 3,945,838
66 3,945,839
87 3,945,840
109 3,945,841
111 3,945,842
308M 3,945,843

CLASS 108

132 3,945,328

CLASS 109

68 3,945,329

CLASS 110

7R 3,945,331

CLASS 111

1 3,945,330
7 3,945,332

CLASS 113

121C 3,945,334

CLASS 114

221R 3,945,335

CLASS 116

28R 3,945,336
36 3,945,337
124B 3,945,338
129F 3,945,339
157 3,945,340

CLASS 118

7 3,945,341
623 3,945,343
637 3,945,342

CLASS 119

51R 3,945,344

CLASS 123

8.05 3,945,345
8.47 3,945,346
18R 3,945,348
30C 3,945,349
32EA 3,945,350
32B 3,945,351
34A 3,945,352
41.22 3,945,353
41.41 3,945,356
52M 3,945,357
56AA 3,945,358
58R 3,945,359
65P 3,945,354
90.18 3,945,355
139AD 3,945,360
141 3,945,361
148E 3,945,362
188M 3,945,363
190BD 3,945,364
191 3,945,365
198A 3,945,366
198F 3,945,367

CLASS 124

24R 3,945,368

CLASS 126

164 3,945,369
271.3 3,945,370

CLASS 128

2B 3,945,371
3,945,372
2S 3,945,373
2.1M 3,945,374
6 3,945,375
78 3,945,376
92EB 3,945,377
145.8 3,945,378
173H 3,945,379
214R 3,945,380
249 3,945,381
272 3,945,382
3,945,383
278 3,945,384
287 3,945,386
350R 3,945,385
419PG 3,945,387

CLASS 134

57R 3,945,388

CLASS 135

45A 3,945,389

CLASS 136

22 Re.28,743
86R 3,945,844
90 3,945,845
100R 3,945,846
3,945,847
3,945,848
107 3,945,849
3,945,850
111 3,945,851
135R 3,945,852
175 3,945,853
202 3,945,854
238 3,945,855

CLASS 137

1 3,945,390
45 3,945,391
205 3,945,392
220 3,945,393
430 3,945,394

495 3,945,395
496 3,945,396
514 3,945,397
527.8 3,945,398
529 3,945,399
608 3,945,400
627.5 3,945,401

CLASS 138

37 3,945,402
118 3,945,403
118.1 3,945,404

CLASS 139

22 3,945,405
54 3,945,406
384B 3,945,407

CLASS 140

105 3,945,408
112 3,945,409

CLASS 141

67 3,945,410
91 3,945,411
130 3,945,412

CLASS 144

246R 3,945,413

CLASS 145

46 3,945,414

CLASS 148

1.5 3,945,856
3,945,857
2 3,945,858
11.5A 3,945,860
11.5R 3,945,859
12.7 3,945,861
31.5 3,945,862
126 3,945,863
175 3,945,864

CLASS 150

7 3,945,415
52M 3,945,416

CLASS 152

209B 3,945,417
213R 3,945,162
243 3,945,418
339 3,945,419
357A 3,945,420
361DM 3,945,422
361FP 3,945,421

CLASS 156

18 3,945,865
126 3,945,866
143 3,945,867
164 3,945,868
180 3,945,869
201 3,945,870
212 3,945,871
244 3,945,872
271 3,945,873
294 3,945,874
308 3,945,875
331 3,945,876
332 3,945,877
539 3,945,878
556 3,945,879

CLASS 162

17 3,945,880
208 3,945,881
340 3,945,882

CLASS 164

75 3,945,423
89 3,945,424
137 3,945,425
3,945,426
298 3,945,427
319 3,945,428
369 3,945,429

CLASS 165

9 3,945,430
11 3,945,431
22 3,945,432
39 3,945,433
166 3,945,434

CLASS 166

267 3,945,435
303 3,945,436
305R 3,945,437
307 3,945,438
308 3,945,439

CLASS 169

54 3,945,440

CLASS 172

43 3,945,441

CLASS 173

10 3,945,442

CLASS 174

11R 3,946,141
15C 3,946,142
84R 3,946,143
92 3,946,144
94R 3,946,145

CLASS 175

73 3,945,443
92 3,945,444
319 3,945,445
323 3,945,446
349 3,945,447

CLASS 176

40 3,945,883
68 3,945,884
78 3,945,885
86R 3,945,886
87 3,945,887

CLASS 177

25 3,945,448

CLASS 178

5.6 3,946,147
5.8AF 3,946,148
6.6B 3,946,149
6.7R 3,946,150
7.1 3,946,151
3,946,152
3,946,153
7.5D 3,946,154
7.6 3,946,155

CLASS 179

1AT 3,946,156
1SA 3,946,157
2TV 3,946,158
3,946,159
6R 3,946,160
15AF 3,946,161
15.55R 3,946,162
18J 3,946,163
84VF 3,946,164
99 3,946,146
100.1TD 3,946,165
100.3V 3,946,166
100.41P 3,946,167
107FD 3,946,168
170R 3,946,169
3,946,170

CLASS 180

6.5 3,945,449
8R 3,945,450
9.52 3,945,451
24.09 3,945,452
54R 3,945,453
68R 3,945,454
79 3,945,455
79.2R 3,945,456
3,945,457
82C 3,945,458
91 3,945,459

CLASS 181

61 3,945,460
153 3,945,461

CLASS 182

150 3,945,462

CLASS 184

6.13 3,945,463
6.16 3,945,464
6.24 3,945,465
7A 3,945,466

CLASS 186

1R 3,945,467

CLASS 187

3,945,468
6 3,945,469
29R 3,945,470

CLASS 188

1A 3,945,471
72.7 3,945,472
296 3,945,473
322 3,945,474

CLASS 192

4A 3,945,475
12D 3,945,476
51 3,945,477
105CD 3,945,478

CLASS 195

29 3,945,888
62 3,945,889

CLASS 197

6.5 3,945,479
84A 3,945,480
90 3,945,481
100 3,945,482

CLASS 198

21 3,945,483
139 3,945,484
155 3,945,485
179 3,945,486
195 3,945,487
249 3,945,488
266 3,945,489

CLASS 200

5R 3,946,171
44 3,946,172
52R 3,946,173
81.4 3,946,174
83J 3,946,176
83L 3,946,175
84C 3,946,177
85A 3,946,178
144B 3,946,179
148A 3,946,180
3,946,183
148D 3,946,184
159B 3,946,182
159R 3,946,181
245 3,946,185
246 3,945,492
339 3,946,186

CLASS 202

84 3,945,890

CLASS 203

77 3,945,891

CLASS 204

1R 3,945,892
16 3,945,893
55R 3,945,894
58 3,945,895
59R 3,945,896
158HA 3,945,897
181 3,945,898
3,945,899
3,945,900
3,945,901
192 3,945,902
3,945,903
195T 3,945,904
212 3,945,905
245 3,945,906
266 3,945,907
278 3,945,908
284 3,945,909
296 3,945,910
298 3,945,911

CLASS 206

.81 3,945,491
1.7 3,945,490
386 3,945,493
389 3,945,494
397 3,945,495
546 3,945,496

CLASS 208

25 3,945,912
137 3,945,913
208R 3,945,914

CLASS 209

12 3,945,915

CLASS 210

7 3,945,916
28 3,945,917
44 3,945,918
50 3,945,919
73W 3,945,920
78 3,945,921
195R 3,945,922
253 3,945,923
384 3,945,924
435 3,945,925
500M 3,945,926
3,945,927
516 3,945,928

CLASS 211

60R 3,945,497
3,945,498
88 3,945,499
113 3,945,500
177 3,945,501

CLASS 212

8B 3,945,502
11 3,945,503
14 3,945,504
144 3,945,333

CLASS 214

1BB 3,945,505
1.2 3,945,506
6B 3,945,507
13 3,945,508
16B 3,945,509
16.4A 3,945,510
17DA 3,945,512
17C 3,945,511
23 3,945,513
27 3,945,514
35R 3,945,515
75T 3,945,516
85.5 3,945,517
142 3,945,518
152 3,945,519
310 3,945,520
506 3,945,521
512 3,945,522

CLASS 215

1R 3,945,523
11R 3,945,524
232 3,945,525
302 3,945,526

CLASS 219

10.55E 3,946,187
3,946,188
69E 3,946,189
91 3,946,190
125R 3,946,191
149 3,946,192
211 3,946,193
213 3,946,194
216 3,946,195
222 3,946,196
290 3,946,197
497 3,946,198
499 3,946,199
3,946,200
511 3,946,201

CLASS 220

90 3,945,527
265 3,945,528
307 3,945,529
329 3,945,530

CLASS 222

27 3,945,531
55 3,945,532
70 3,945,533
105 3,945,534
146HE 3,945,535
148 3,945,536
240 3,945,537
333 3,945,538
386.5 3,945,539
525 3,945,540

CLASS 223

38 3,945,541
42 3,945,542
88 3,945,543

CLASS 224

32R 3,945,544

CLASS 226

97 3,945,545
118 3,945,546
172 3,945,547

CLASS 227

8 3,945,548
45 3,945,549
126 3,945,550
136 3,945,551

CLASS 228

17.5 3,945,552
20 3,945,553
110 3,945,554
126 3,945,555
263 3,945,556

CLASS 229

15 3,945,557
23R 3,945,558
38 3,945,559
40 3,945,560
41B 3,945,561
62.5 3,945,562

CLASS 235

61.11D 3,946,206
61.11E 3,946,203
3,946,205
61.11R 3,946,204
61.7B 3,946,202
88M 3,946,207
92DE 3,946,209
92EA 3,946,208
92SA 3,946,210
96 3,945,563
151.1 3,946,211
151.13 3,946,212
151.32 3,946,213
152 3,946,214
3,946,215
156 3,946,216
3,946,217
3,946,218
159 3,946,219
168 3,946,220

CLASS 236

46E 3,945,564
49 3,945,565

CLASS 238

349 3,945,566

CLASS 239

14 3,945,567
57 3,945,568
112 3,945,569
135 3,945,570
152 3,945,571
171 3,945,572
265.35 3,945,573
404 3,945,574

CLASS 240

128 3,946,221

CLASS 241

20 3,945,575
46.17 3,945,576

CLASS 242

4C 3,945,577
7.21 3,945,578
18DD 3,945,579
25A 3,945,580
43R 3,945,581
55.19A 3,945,582
56.9 3,945,583
71.1 3,945,584
81 3,945,585
107.4A 3,945,587
107.4D 3,945,586

CLASS 244

3.16 3,945,588
30 3,945,589
77A 3,945,590
77D 3,945,593
98 3,945,591
152 3,945,592

CLASS 248

74A 3,945,594
239 3,945,595
311R 3,945,596
327 3,945,597
441D 3,945,598
466 3,945,600
476 3,945,599

CLASS 249

48 3,945,601
219R 3,945,602

CLASS 250

201 3,946,222
211J 3,946,223
221 3,946,224
237G 3,946,225
256 3,946,226
281 3,946,227
282 3,946,228
292 3,946,229
316 3,946,230
328 3,946,231
333 3,946,232
347 3,946,233
363S 3,946,234
373 3,946,235
402 3,946,236
432PD 3,946,237
3,946,238
461B 3,946,239
493 3,946,240
574 3,946,241

CLASS 251

148 3,945,603
174 3,945,604
212 3,945,605
326 3,945,606
357 3,945,607

CLASS 252

8.55D 3,945,929
32.5 3,945,930
3,945,931
33.3 3,945,933
54 3,945,932
62.1P 3,945,934
62.3V 3,945,935
95 3,945,936
102 3,945,937
107 3,945,938
182 3,945,939
186 3,945,940
3,945,941
373 3,945,942
455R 3,945,944
455Z 3,945,943
463 3,945,945
465 3,945,946
466B 3,945,947
472 3,945,948
514 3,945,949
522 3,945,950
546 3,945,951

CLASS 254

29R 3,945,608
60 3,945,609
93R 3,945,610
131 3,945,611
173R 3,945,612

CLASS 259

1R 3,945,613
4R 3,945,614
6 3,945,615
9 3,945,616
54 3,945,617
114 3,945,618
154 3,945,619
191 3,945,620
3,945,621
3,945,622

CLASS 260

2N 3,945,952
3,945,953
2.5AR 3,945,954
2.5B 3,945,956
2.5P 3,945,955
3.3 3,945,957
17A 3,945,958
20 3,945,959
29.4UA 3,945,961
29.6MM 3,945,962
3,945,965
29.6NR 3,945,963
3,945,964
31.8R 3,945,974
33.6AQ 3,945,975
3,945,976
3,945,977
3,945,978
37PC 3,945,979
39P 3,945,980
42.15 3,945,966
45.8A 3,945,967
45.95R 3,945,968
47EN 3,945,971
47EP 3,945,972
47UA 3,945,970
47XA 3,945,969
49 3,945,973
75NB 3,945,981
77.5BB 3,945,982
78L 3,945,983
3,945,984
92.8W 3,945,985
93.1 3,945,986
96.5C 3,945,987
112.7 3,945,988
153 3,945,989
3,945,990
162 3,945,991
174 3,945,992
210AB 3,945,993
239.001 Re.28,744
239.1 3,945,994
3,945,995
239.3R 3,945,996
239.55R 3,945,997
240D 3,945,998
240G 3,945,999
243A 3,946,004
3,946,035
243C 3,946,000
3,946,001
3,946,002
3,946,003
3,946,005
243R 3,946,006
247.1R 3,946,007
247.2B 3,946,008
247.5D 3,946,009
248AS 3,946,010
249.6 3,946,011
251A 3,945,960
251.5 3,946,012
256.4N 3,946,013
268C 3,946,014
268H 3,946,015
287C 3,946,017
287D 3,946,018
287L 3,946,016
287P 3,946,019
290P 3,946,020
293.61 3,946,021
293.64 3,946,022
294.8B 3,946,025
294.8R 3,946,023
294.9 3,946,024
295.5R 3,946,026
3,946,027
3,946,028
296B 3,946,029
306 3,946,030
306.8F 3,946,031
308R 3,946,032
309.5 3,946,033
3,946,034
327B 3,946,036
329S 3,946,037
330.5 3,946,038
340.3 3,946,040
340.5 3,946,041
3,946,042
340.7 3,946,043
340.9 3,946,044
3,946,045
343.3R 3,946,046
346.2R 3,946,048
347.2 3,946,049
348R 3,946,050
349 3,946,051
397.5 3,946,052
404.5 3,946,053
408 3,946,054
410.9R 3,946,055
429.7 3,946,056
439R 3,946,057
448A 3,946,058
448.2E 3,946,059
448.2N 3,946,060
448.8R 3,946,061
453R 3,946,062
463 3,946,063
3,946,064
464 3,946,065
465.8D 3,946,066

476R 3,946,067
497A 3,946,068
534S 3,946,069
537P 3,946,070
543H 3,946,071
543R 3,946,072
553B 3,946,073
561K 3,946,074
570.5C 3,946,075
586AB 3,946,077
586P 3,946,076
586R 3,946,078
593R 3,946,079
3,946,080
597R 3,946,081
604HF 3,946,082
611A 3,946,083
613R 3,946,084
615A 3,946,085
624R 3,946,086
631H 3,946,087
683.75 3,946,088
857PG 3,946,089
857R 3,946,090
860 3,946,091
964 3,946,092
973 3,946,093

CLASS 264

28 3,946,094
36 3,946,095
46.1 3,946,096
90 3,946,097
117 3,946,098
174 3,946,099
210F 3,946,100
332 3,946,039

CLASS 266

3R 3,945,623
20 3,945,624

CLASS 267

47 3,945,625
64R 3,945,626
108 3,945,627
152 3,945,628

CLASS 269

.5 3,945,629
131 3,945,631
321F 3,945,630

CLASS 270

52 3,945,632

CLASS 271

3.1 3,945,633
183 3,945,634
202 3,945,635
210 3,945,095
274 3,945,636

CLASS 272

73 3,945,637

CLASS 273

1.5A 3,945,638
3A 3,945,639
85R 3,945,640
95R 3,945,641
106.5R 3,945,642
134B 3,945,643
143D 3,945,644
157R 3,945,645
186A 3,945,646

CLASS 274

47 3,945,647

CLASS 277

102 3,945,648
123 3,945,649
165 3,945,650

CLASS 279

1D 3,945,652
97 3,945,653
123 3,945,654

CLASS 280

7.15 3,945,667
11.2 3,945,655
11.35B 3,945,657
11.35D 3,945,656
11.35K 3,945,658
34R 3,945,659
42 3,945,660
46 3,945,661
87R 3,945,662
124F 3,945,663
3,945,664
150AB 3,945,665
150.5 3,945,666
423R 3,945,668

CLASS 285

92 3,945,669

CLASS 292

3,945,670
323 3,945,671

CLASS 293

5 3,945,672

CLASS 294

67DA 3,945,673
67R 3,945,674
81R 3,945,675
88 3,945,676

CLASS 296

1S 3,945,677

CLASS 297

337 3,945,651
390 3,945,678

CLASS 299

5 3,945,679
43 3,945,680
68 Re.28,741
86 3,945,681

CLASS 302

12 3,945,682
28 3,945,683

CLASS 303

1 3,945,684
2 3,945,685
6C 3,945,686
21R 3,945,687
22R 3,945,688
3,945,689
3,945,690
84R 3,945,691

CLASS 307

31 3,946,244
45 3,946,242
140 3,946,243
205 3,946,245
218 3,946,246
221D 3,946,247
3,946,248
233A 3,946,249
237 3,946,251
241 3,946,250
252B 3,946,252
261 3,946,253
268 3,946,254
269 3,946,255

CLASS 308

9 3,945,692
20 3,945,693
184A 3,945,694
240 3,945,695

CLASS 310

9.5 3,946,256
9.6 3,946,257
14 3,946,258
49R 3,946,259
112 3,946,260

CLASS 312

257R 3,945,696

CLASS 313

56 3,946,261
174 3,946,262
312 3,946,263
388 3,946,264
390 3,946,265
442 3,946,266
473 3,946,267

CLASS 315

31R 3,946,268
151 3,946,269
169TV 3,946,270
241S 3,946,271
267 3,946,272
297 3,946,273
371 3,946,274
383 3,946,275

CLASS 316

17 3,945,697
26 3,945,698

CLASS 317

11A 3,946,277
16 3,946,278
18C 3,946,279
31 3,946,280
36TD 3,946,281
48 3,946,282
100 3,946,276
120 3,946,283
123 3,946,284
3,946,285
124 3,946,286
148.5R 3,946,287
3,946,288
230 3,946,289
258 3,946,290

CLASS 318

7 3,946,291
138 3,946,292
227 3,946,293
313 3,946,294
317 3,946,295
563 3,946,296
609 3,946,297
685 3,946,298

CLASS 320

43 3,946,299

CLASS 321

8C 3,946,300
11 3,946,301

CLASS 323

19 3,946,302
22T 3,946,303
24 3,946,304

CLASS 324

16R 3,946,305
3,946,306
34R 3,946,307
58.5C 3,946,308
64 3,946,309
72.5 3,946,310
167 3,946,311
181 3,946,312

CLASS 325

18 3,946,313
51 3,946,314
55 3,946,315
310 3,946,316
354 3,946,317
411 3,946,318
459 3,946,319
470 3,946,320

CLASS 328

25 3,946,321
58 3,946,322
63 3,946,323

CLASS 330

10 3,946,324
22 3,946,325
26 3,946,326
35 3,946,327
107 3,946,328

CLASS 331

4 3,946,329
8 3,946,330
94.5PE 3,946,332
94.5H 3,946,334
94.5P 3,946,331
3,946,333
94.5S 3,946,335
107R 3,946,336

CLASS 332

22 3,946,337

CLASS 333

11 3,946,339
24.1 3,946,340
30R 3,946,338
3,946,341
72 3,946,342
95A 3,946,343

CLASS 334

7 3,946,344

CLASS 335

9 3,946,345
16 3,946,346
202 3,946,347
216 3,946,348

CLASS 336

62 3,946,349
208 3,946,350

CLASS 337

224 3,946,351
361 3,946,352

CLASS 338

318 3,946,353

CLASS 339

12R 3,945,699
59M 3,945,700
60R 3,945,701
88R 3,945,702
89M 3,945,703
95D 3,945,711
97C 3,945,704
98 3,945,705
113L 3,945,706
128 3,945,707
189R 3,945,708
257 3,945,709
258R 3,945,710

CLASS 340

4E 3,946,354
6R 3,946,355
15.5SS 3,946,356
15.5TS 3,946,357
27R 3,946,358
52H 3,946,359
61 3,946,360
146.3AC 3,946,361
147SY 3,946,362
172.5 3,946,363
3,946,364
3,946,365
3,946,366
173LM 3,946,367
3,946,370
173PL 3,946,371
173R 3,946,368
3,946,369
3,946,381
174TF 3,946,372
3,946,373
237S 3,946,374
253C 3,946,375
258R 3,946,376
274R 3,946,377
324M 3,946,378
347DD 3,946,379
384E Re.28,745
409 3,946,380

CLASS 343

5DP 3,946,382
6.8R 3,946,393
7ED 3,946,384
7A 3,946,383
13R 3,946,394
102 3,946,385
106D 3,946,386
109 3,946,387
113R 3,946,388
3,946,395
225 3,946,389
702 3,946,390
709 3,946,391
753 3,946,396
788 3,946,397
830 3,946,392

CLASS 346

1 3,946,398
3,946,399
74EE 3,946,403
74ES 3,946,401
3,946,402
74E 3,946,400
74.1 3,946,404
140R 3,946,405
145 3,946,406

CLASS 350

54 3,945,713
103 3,945,714
150 3,945,715
174 3,945,716
237 3,945,717

CLASS 351

6 3,945,712

CLASS 352

12 3,945,718
72 3,945,719

CLASS 353

12 3,945,720
84 3,945,721
122 3,945,722

CLASS 354

6 3,946,407
51 3,946,408
173 3,946,409
3,946,410
174 3,946,411
204 3,946,412
251 3,946,413
258 3,946,414

CLASS 355

3P 3,945,724
3R 3,945,723
3,945,725
3,945,726
27 3,945,727
75 3,945,728

CLASS 356

5 3,945,729
167 3,945,730
178 3,945,731
222 3,945,732

CLASS 357

15 3,946,415
17 3,946,416
3,946,417
23 3,946,418
3,946,419
24 3,946,420
3,946,421
26 3,946,422
30 3,946,423
42 3,946,424
64 3,946,425
71 3,946,426
72 3,946,427
74 3,946,428
81 3,946,429

CLASS 358

2 3,946,430
9 3,946,431
13 3,946,432
41 3,946,433
44 3,946,434

CLASS 360

14 3,946,435
74 3,946,436
79 3,946,437
88 3,946,438
105 3,946,439
118 3,946,440

CLASS 401

94 3,945,733
198 3,945,734
216 3,945,735
289 3,945,736

CLASS 403

27 3,945,737
109 3,945,738
138 3,945,739
217 3,945,740
232 3,945,741
255 3,945,742
290 3,945,743
317 3,945,744

CLASS 404

1 3,945,745
4 3,945,746
7 3,945,747
117 3,945,748

CLASS 408

95 3,945,749
117 3,945,750
127 3,945,751
146 3,945,752
201 3,945,753

CLASS 415

1 3,945,754
5 3,945,755
66 3,945,756
80 3,945,757
90 Re.28,742
144 3,945,758
145 3,945,759
189 3,945,760

CLASS 416

188 3,945,761

CLASS 417

18 3,945,762
211 3,945,763
212 3,945,764
269 3,945,765
273 3,945,766
313 3,945,767
317 3,945,768
361 3,945,769
401 3,945,770
424 3,945,771
489 3,945,772
494 3,945,773
554 3,945,774

CLASS 418

113 3,945,775
142 3,945,776
188 3,945,777
195 3,945,778
206 3,945,779
232 3,945,780

CLASS 423

210 3,946,101
600 3,946,102
633 3,946,103
659 3,946,104

CLASS 424

12 3,946,105
15 3,946,106
49 3,946,108
93 3,946,107
95 3,946,109
230 3,946,110
275 3,946,111
308 3,946,112
330 3,946,119
346 3,946,047

CLASS 425

115 3,945,781
122 3,945,783
127 3,945,782
130 3,945,784
132 3,945,785
208 3,945,786
262 3,945,787
363 3,945,788
371 3,945,789
385 3,945,790

CLASS 426

60 3,946,114
72 3,946,115
103 3,946,116
231 3,946,113
281 3,946,117
321 3,946,118
532 3,946,120
548 3,946,121
604 3,946,122
643 3,946,123

CLASS 427

8 3,946,124
46 3,946,125
283 3,946,126

CLASS 428

48 3,946,127
66 3,946,128
304 3,946,129
325 3,946,130
378 3,946,131
3,946,132
400 3,946,133
403 3,946,134
411 3,946,135
422 3,946,136
452 3,946,137
514 3,946,138
518 3,946,139
522 3,946,140

D1—	23	239,215		168	239,239		253	239,254		J	239,276		5CB	239,304		R	239,320
D2—	233	239,218			239,240			239,255		7R	239,279		NN	239,299	D56—	4B	239,321
	239	239,216			239,242			239,256	D19—	57	239,280		TT	239,300			239,322
	310	239,217		172	239,232			239,257	D22—	1	239,282		K	239,301			239,324
	361	239,220			239,238	D10—	11	239,266		27	239,281			239,302			239,339
	389	239,219		187	239,241		57	239,261	D23—	13	239,284			239,303		D	239,325
D4—	25	239,221		246	239,237			239,262		19	239,283			239,306		R	239,323
D6—	9	239,230	D7—	71	239,244		106	239,265		163	239,285		15UU	239,305	D59—	2A	239,326
	20	239,224		77	239,249		123	239,264		167	239,286		C	239,309	D64—	11	239,327
	47	239,234		128	239,246		124	239,263	D26—	1G	239,288	D35—	3A	239,297		12B	239,328
	48	239,226			239,250	D12—	76	239,274		5C	239,287			239,307	D77—	1R	239,329
	49	239,223		137	239,247		135	239,268			239,289			239,308	D83—	A	239,330
	61	239,236		161	239,243		136	239,273			239,291	D40—	1	239,311		12	239,332
	63	239,235		188	239,245		142	239,270			239,292	D45—	10	239,312		R	239,331
	69	239,222		190	239,248		146	239,271			239,293	D48—	20D	239,313	D86—	8	239,333
	71	239,228	D8—	66	239,252		156	239,269		14J	239,290		F	239,314	D87—	1D	239,336
	127	239,225		232	239,258		162	239,275	D27—	3	239,294		K	239,315		R	239,334
	129	239,229		242	239,251		205	239,272	D28—	1A	239,295	D52—	2C	239,316			239,335
	153	239,233	D9—	38	239,259		209	239,267	D29—	19R	239,296	D54—	4	239,318			239,337
	157	239,231		177	239,260	D13—	1B	239,277	D32—	1	239,310	D55—	1A	239,317	D96—	12	239,338
	162	239,227		191	239,253		E	239,278	D34—	3	239,298		G	239,319			

CLASSIFICATION OF PLANTS

P. —	11	3,847	P. —	27	3,846	P. —	38	3,850	P. —	69	3,848	P. —		3,849			

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1	:	3,945,866	3,945,336	3,945,862	3,946,383	10	:	3,945,262	3,945,481
		3,945,906	3,945,352	3,945,869	3,946,396			3,945,804	3,945,484
		3,946,236	3,945,364	3,945,879	3,946,398			3,945,876	3,945,501
		3,946,240	3,945,368	3,945,890	3,946,415			3,946,051	3,945,559
		3,946,374	3,945,369	3,945,904	3,946,431	11	:	3,945,338	3,945,568
4	:	3,945,111	3,945,380	3,945,905	8 : 3,945,134	12	:	3,945,059	3,945,608
		3,945,144	3,945,382	3,945,915	3,945,135			3,945,123	3,945,622
		3,945,195	3,945,389	3,945,920	3,945,162			3,945,133	3,945,627
		3,945,248	3,945,395	3,945,926	3,945,462			3,945,228	3,945,643
		3,945,414	3,945,400	3,945,940	3,945,465			3,945,240	3,945,650
		3,945,505	3,945,401	3,945,943	3,945,571			3,945,385	3,945,693
		3,945,590	3,945,408	3,945,976	3,945,718			3,945,467	3,945,696
		3,946,246	3,945,425	3,946,031	3,946,395			3,945,490	3,945,717
		3,946,277	3,945,426	3,946,039	9 : 3,945,108			3,945,499	3,945,741
		3,946,391	3,945,434	3,946,047	3,945,115			3,945,560	3,945,756
		3,946,423	3,945,461	3,946,052	3,945,118			3,945,589	3,945,757
5	:	3,945,366	3,945,469	3,946,062	3,945,154			3,945,601	3,945,767
6	:	3,945,048	3,945,472	3,946,107	3,945,199			3,945,606	3,945,769
		3,945,051	3,945,489	3,946,116	3,945,227			3,945,646	3,945,774
		3,945,055	3,945,496	3,946,123	3,945,318			3,945,715	3,945,812
		3,945,062	3,945,503	3,946,124	3,945,354			3,945,747	3,945,826
		3,945,067	3,945,504	3,946,150	3,945,381			3,945,755	3,945,843
		3,945,070	3,945,507	3,946,173	3,945,478			3,945,781	3,945,914
		3,945,087	3,945,525	3,946,175	3,945,569			3,946,193	3,945,921
		3,945,092	3,945,526	3,946,185	3,945,618			3,946,205	3,945,923
		3,945,093	3,945,542	3,946,191	3,945,635			3,946,337	3,946,043
		3,945,110	3,945,544	3,946,206	3,945,637			3,946,390	3,946,044
		3,945,114	3,945,588	3,946,209	3,945,682			3,946,397	3,946,045
		3,945,128	3,945,604	3,946,216	3,945,710			3,946,426	3,946,074
		3,945,136	3,945,629	3,946,218	3,945,744	13	:	3,945,277	3,946,095
		3,945,140	3,945,631	3,946,220	3,945,844			3,945,294	3,946,106
		3,945,145	3,945,644	3,946,222	3,945,860			3,945,699	3,946,111
		3,945,146	3,945,654	3,946,237	3,945,900			3,945,736	3,946,113
		3,945,147	3,945,655	3,946,238	3,945,938			3,945,743	3,946,115
		3,945,170	3,945,667	3,946,268	3,945,954			3,946,340	3,946,146
		3,945,171	3,945,669	3,946,282	3,945,961	16	:	3,945,044	3,946,147
		3,945,172	3,945,671	3,946,302	3,945,981			3,945,534	3,946,148
		3,945,196	3,945,672	3,946,310	3,946,016	17	:	3,945,064	3,946,164
		3,945,202	3,945,674	3,946,313	3,946,038			3,945,163	3,946,165
		3,945,211	3,945,695	3,946,315	3,946,064			3,945,167	3,946,166
		3,945,213	3,945,700	3,946,321	3,946,099			3,945,175	3,946,186
		3,945,238	3,945,703	3,946,322	3,946,176			3,945,180	3,946,200
		3,945,250	3,945,704	3,946,323	3,946,210			3,945,191	3,946,231
		3,945,251	3,945,716	3,946,331	3,946,219			3,945,270	3,946,245
		3,945,253	3,945,729	3,946,332	3,946,258			3,945,293	3,946,252
		3,945,276	3,945,738	3,946,339	3,946,261			3,945,334	3,946,293
		3,945,295	3,945,740	3,946,365	3,946,280			3,945,353	3,946,311
		3,945,309	3,945,751	3,946,367	3,946,305			3,945,378	3,946,319
		3,945,316	3,945,801	3,946,368	3,946,306			3,945,411	3,946,360
		3,945,322	3,945,816	3,946,369	3,946,343			3,945,449	3,946,381
		3,945,329	3,945,857	3,946,372	3,946,432			3,945,479	3,946,399

3,946,405
3,946,438
18 : Re.28,745
3,945,053
3,945,097
3,945,099
3,945,127
3,945,155
3,945,159
3,945,249
3,945,269
3,945,301
3,945,302
3,945,361
3,945,460
3,945,486
3,945,527
3,945,630
3,945,967
3,946,003
3,946,004
3,946,297
3,946,329
19 : 3,945,265
3,945,333
3,945,557
3,945,666
3,945,668
3,946,229
3,946,256
3,946,346
20 : 3,945,046
3,945,291
3,945,473
3,945,572
3,945,659
3,945,745
21 : 3,945,307
3,945,684
22 : 3,946,263
23 : 3,946,135
24 : 3,945,174
3,945,254
3,945,372
3,945,509
3,945,528
3,945,645
3,945,746
3,945,845
3,945,855
3,945,863
3,945,917
3,945,982
3,946,085
3,946,096
3,946,214
3,946,244
3,946,382
25 : 3,945,043
3,945,061
3,945,071
3,945,074
3,945,075
3,945,117
3,945,122
3,945,209
3,945,215
3,945,239
3,945,244
3,945,373
3,945,406
3,945,447
3,945,498
3,945,598
3,945,632
3,945,694
3,945,731
3,945,846
3,945,848
3,945,849
3,945,852
3,945,870
3,945,881
3,946,139
3,946,156
3,946,170
3,946,187
3,946,188

3,946,241
3,946,262
3,946,267
3,946,324
3,946,349
3,946,352
3,946,366
3,946,373
3,946,376
3,946,385
3,946,393
26 : 3,945,050
3,945,068
3,945,102
3,945,105
3,945,132
3,945,217
3,945,267
3,945,308
3,945,314
3,945,362
3,945,365
3,945,376
3,945,388
3,945,410
3,945,474
3,945,495
3,945,533
3,945,564
3,945,586
3,945,587
3,945,641
3,945,652
3,945,656
3,945,657
3,945,673
3,945,737
3,945,775
3,945,800
3,945,894
3,945,903
3,945,907
3,945,911
3,945,956
3,945,960
3,945,973
3,946,007
3,946,015
3,946,046
3,946,056
3,946,102
3,946,177
3,946,198
3,946,243
3,946,254
3,946,285
3,946,354
27 : Re.28,742
3,945,083
3,945,281
3,945,287
3,945,332
3,945,493
3,945,497
3,945,530
3,945,549
3,945,558
3,945,610
3,945,639
3,945,705
3,945,768
3,945,935
3,946,110
3,946,117
3,946,130
3,946,168
3,946,299
3,946,402
3,946,439
28 : 3,945,200
3,945,450
29 : 3,945,139
3,945,143
3,945,158
3,945,286
3,945,335
3,945,543
3,945,670

3,945,896
3,945,959
3,946,071
30 : 3,945,444
3,945,753
31 : 3,945,787
32 : 3,945,827
3,946,312
33 : 3,945,567
34 : 3,945,052
3,945,060
3,945,112
3,945,116
3,945,176
3,945,182
3,945,207
3,945,220
3,945,246
3,945,274
3,945,391
3,945,424
3,945,523
3,945,524
3,945,539
3,945,554
3,945,556
3,945,566
3,945,602
3,945,605
3,945,609
3,945,678
3,945,707
3,945,709
3,945,721
3,945,734
3,945,842
3,945,864
3,945,878
3,945,902
3,945,913
3,945,918
3,945,928
3,945,932
3,945,933
3,945,937
3,945,941
3,945,944
3,945,946
3,945,955
3,945,974
3,945,993
3,945,997
3,946,008
3,946,010
3,946,025
3,946,041
3,946,053
3,946,054
3,946,082
3,946,088
3,946,100
3,946,101
3,946,114
3,946,119
3,946,126
3,946,145
3,946,174
3,946,260
3,946,283
3,946,301
3,946,316
3,946,318
3,946,325
3,946,327
3,946,335
3,946,338
3,946,345
3,946,379
3,946,392
35 : 3,945,370
3,945,722
3,946,239
36 : 3,945,076
3,945,077
3,945,096
3,945,100
3,945,109
3,945,210

3,945,223
3,945,272
3,945,283
3,945,297
3,945,326
3,945,342
3,945,343
3,945,375
3,945,402
3,945,436
3,945,442
3,945,480
3,945,482
3,945,491
3,945,546
3,945,553
3,945,574
3,945,595
3,945,599
3,945,603
3,945,617
3,945,619
3,945,660
3,945,702
3,945,724
3,945,728
3,945,760
3,945,823
3,945,925
3,945,934
3,945,942
3,945,985
3,945,987
3,946,011
3,946,042
3,946,049
3,946,075
3,946,121
3,946,149
3,946,154
3,946,190
3,946,230
3,946,273
3,946,275
3,946,294
3,946,394
3,946,401
3,946,404
3,946,418
3,946,419
3,946,433
37 : 3,945,080
3,945,081
3,945,084
3,945,346
3,945,417
3,945,607
3,945,683
3,946,132
3,946,207
3,946,250
39 : 3,945,042
3,945,057
3,945,069
3,945,233
3,945,260
3,945,264
3,945,273
3,945,275
3,945,311
3,945,379
3,945,383
3,945,396
3,945,422
3,945,443
3,945,500
3,945,547
3,945,575
3,945,638
3,945,642
3,945,677
3,945,686
3,945,752
3,945,759
3,945,764
3,945,786
3,945,819
3,945,838

3,945,839
3,945,847
3,945,875
3,945,901
3,945,936
3,945,945
3,945,962
3,945,963
3,945,965
3,945,966
3,945,970
3,945,975
3,945,986
3,946,021
3,946,022
3,946,067
3,946,072
3,946,112
3,946,128
3,946,131
3,946,134
3,946,137
3,946,138
3,946,201
3,946,271
3,946,287
40 : 3,945,107
3,945,977
3,946,030
3,946,295
41 : 3,945,271
3,945,299
3,945,377
3,946,225
42 : Re.28,741
3,945,082
3,945,130
3,945,150
3,945,225
3,945,234
3,945,241
3,945,252
3,945,257
3,945,268
3,945,344
3,945,374
3,945,510
3,945,512
3,945,521
3,945,565
3,945,633
3,945,687
3,945,697
3,945,758
3,945,791
3,945,795
3,945,808
3,945,811
3,945,821
3,945,861
3,945,865
3,945,877
3,945,891
3,946,005
3,946,180
3,946,183
3,946,196
3,946,211
3,946,255
3,946,274
3,946,276
3,946,278
3,946,279
3,946,429
44 : 3,945,089
3,945,266
3,945,339
3,945,708
3,946,264
45 : 3,945,288
3,945,415
3,945,453
47 : 3,945,151
3,945,929
3,946,061
48 : 3,945,047
3,945,218
3,945,232

3,945,256
3,945,341
3,945,367
3,945,392
3,945,435
3,945,437
3,945,438
3,945,439
3,945,448
3,945,628
3,945,636
3,945,661
3,945,679
3,945,763
3,945,770
3,945,939
3,946,058
3,946,073
3,946,127
3,946,182
3,946,203
3,946,226
3,946,247
3,946,248
3,946,342
3,946,357
3,946,420
3,946,421
49 : 3,945,384
3,945,880
3,945,924
3,946,384
50 : 3,946,417
51 : 3,945,041
3,945,045
3,945,056
3,945,160
3,945,323
3,945,337
3,945,555
3,945,873
3,946,161
3,946,416
52 : 3,945,809
3,946,195
53 : 3,945,058
3,945,086
3,945,141
3,945,313
3,945,331
3,945,394
3,945,583
3,945,785
3,946,163
3,946,215
3,946,358
3,946,364
3,946,375
3,946,387
54 : 3,945,104
3,946,057
55 : 3,945,079
3,945,120
3,945,201
3,945,208
3,945,236
3,945,247
3,945,328
3,945,387
3,945,451
3,945,475
3,945,485
3,945,624
3,945,749
3,945,805
3,945,806
3,945,853
3,945,867
3,946,242
3,946,284
3,946,291
3,946,300
3,946,351
56 : 3,945,502
3,945,648
3,946,159

4	239,295		239,302	14	239,296	23	239,278	36	239,221		239,326
	239,329		239,303	17	239,226	25	239,287		239,225	40	239,335
6	239,219		239,306		239,229		239,293		239,231		239,337
	239,220		239,307		239,236		239,313		239,232	41	239,316
	239,222		239,312		239,254		239,328		239,235		239,333
	239,223		239,318		239,255	26	239,264		239,244	42	239,224
	239,243		239,319		239,256		239,267		239,247		239,238
	239,251	8	239,336		239,257		239,268		239,276		239,239
	239,253	9	239,234		239,280		239,269		239,320		239,240
	239,275		239,252		239,283		239,270		239,321		239,241
	239,277		239,265		239,325		239,271		239,334		239,242
	239,284		239,282	18	239,261		239,294	37	239,281	47	239,311
	239,289		239,300		239,262	29	239,338		239,317		239,330
	239,292	11	239,216	19	239,304	31	239,286	39	239,233		239,331
	239,297	12	239,263	20	239,249	34	239,274		239,279	53	239,288
	239,301	13	239,218	21	239,248		239,305		239,310	55	239,298

PLANT PATENTS

6	3,847	3,850			

U. S. GOVERNMENT PRINTING OFFICE : O - 1976

U.S. DEPARTMENT OF COMMERCE
Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, Commissioner